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A GUIDE  
TO THE  
DISEASES OF THE EYE,  
AND THEIR  
TREATMENT.

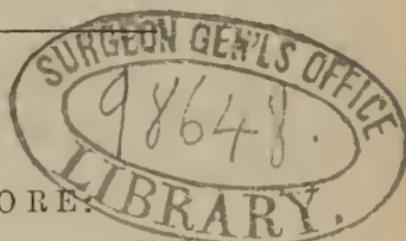
FOR THE USE OF  
STUDENTS AND YOUNG PRACTITIONERS.

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BY ✓  
DR. F. A. von MOSCHZISKER,  
Oculist and Aurist,  
AUTHOR OF "SPECTACLES, WHY AND WHEN TO USE THEM," ETC.

BALTIMORE:  
CUSHINGS & BAILEY.

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TO

ROBLEY DUNGLISON, M. D.

PROFESSOR OF THE INSTITUTES OF MEDICINE, ETC.

IN JEFFERSON MEDICAL COLLEGE, PHILADELPHIA.

DEAR SIR,—If by the dedication of a book to a person is meant to express the esteem in which he is held by the author, or to evince the debt of gratitude the writer owes to him, then do I know of no man deserving of higher respect, or to whom the medical profession is more largely indebted for labors well done, than yourself. It is now some years since I had the honor of delivering a letter of introduction to you, and of being by you introduced to several of the world-renowned men who preside over the medical institutions in your city; and during my stay in Philadelphia I received many proofs of your hospitable feelings and readiness to advise a stranger in a strange land. Since then I have become familiar with your valuable productions, and desire, in gratitude for personal kindnesses, and as a testimony of sincere respect for your eminent talents, and in admiration of your many valuable contributions to medical science, to dedicate to you this little volume.

I have the honor to be, with great respect,

Your obedient and humble servant,

F. A. VON MOSCHZISKER.



## P R E F A C E.

---

THE compiler of this work is as far from claiming for himself the title of author as he is from assuming peculiar merit for having brought before the profession any thing new. Such is not his pretension ; and yet, while he thus disclaims originality or novelty, he is not without hope that the intrinsic utility of the work now offered will win for him the thanks of the medical student and young practitioner. The book which bears the title of “The Student’s and Young Practitioner’s Guide to Ophthalmic Diseases,” is compiled from the best writers, who have made this subject a specialty, and from lectures, both published and unpublished, delivered in this country and in Europe. At the same time the various journals and periodicals devoted to this, as well as the kindred branches of medical science, have been industriously examined and collated.

In forming this work the compiler’s chief labor was to endeavor to employ his best judgment in choosing from each author the most explicit portions which treat of the disease that heads each section, and so to combine the extracts as to bring under one view the description of the nature, symptoms, and appearances of each disease.

In the directions in regard to treatment it has been his object to be as explicit as possible. While giving the views of the best teachers and writers on the subject, he has ventured to introduce also the results of his own experience. Numerous works, some very voluminous, in many languages, have been written on diseases of the eye ; the most important of these, in German, French and English, have been carefully read and studied by the framer of this compilation. His chief aim in the present book is to give to those for whom it is compiled, such a

work as its title expresses; it will not make the student an accomplished oculist, but, if carefully studied, will make him sufficiently acquainted with those diseases to which the eye is most subject, and which require prompt treatment in effecting their cure. It may also serve as a hand-book that may be consulted on any emergency to assist in forming a just diagnosis, and in directing proper treatment. This is all at which the compiler has aimed, and if found to be worthy of its name, his labors will be amply repaid.

The most important of the works from which this book is compiled are given at the end of this volume, so as to serve as reference should further information be sought.

F. A. VON MOSCNISKER.

34 Hanover Street, Sept. 1856.



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# INTRODUCTION.

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## OPHTHALMY, OPHTHALMIA, OPHthalmitis, INFLAMMATION OF THE EYE.

OPHTHALMIA is not only a secondary disease, resulting from various affections of the eye and adjacent parts, on the existence of which its continuance entirely depends; but is also frequently the primary complaint, and too often the forerunner of such disorders as for ever deprive the patient of the power of vision—a loss which no worldly advantage can ever fully compensate. A classic author advances the idea that blindness possesses, at least, the advantage of excluding from the mind incentives to vice. The eccentric QUINTILIAN, to whom I allude, endeavors, partly upon this ground, to exculpate a blind man, charged with parricide, thus: “*Vultus ille perpetuā nocte coöpertus non concipit nefas, ad quod ducibus oculis pervenitur; . . . vitiis enim nostris in animum per oculos via est.*” And, again: “*Magna innocentiae necessitas est, neminem facilius posse deprehendi.*”\* But with equal eloquence, and greater truth, he dwells on that which is more to my present purpose—the pitiable effects of this misfortune alike on mind and body. “All boldness of spirit,” he says, “is broken by the calamity, and those emotions of the mind grow cold, which the eyes, its ministers, cease to convey. Indeed, the blind man’s sole remaining mission in the world would seem to be to afford to others occasions of benevolence and an example of

\* LITERAL TRANSLATION.—“The countenance, which is veiled with perpetual night, does not perceive what is evil, to which, however, it easily arrives with open eyes. . . . The way by which sin enters the soul is through the eyes.—*Quint. pro Cæco, De Iom. I.*

The whole of this and the succeeding oration will repay perusal, not alone from the beauty of their composition, but also from the ingenuity with which the medico-legal points of the case are brought out in argument. See, also, Dr. J. F. France’s introduction to his *Lectures on Diseases of the Eye*, London *Lancet*, February, 1854.]

resignation, and for himself due preparation to await the day when even his ‘eye shall see the king in his beauty, and shall behold the land which is very far off.’” If such be the weight of this affliction, it is not easy to overrate the value of that study which may be the means of averting, of mitigating, or of removing it; and yet how little attention does the medical student, during his collegiate years, or the young practitioner, give to the acquirement of a knowledge of this branch of the healing art? Well may Dr. Gritchett exclaim,\* “I think it must be conceded by all practical ophthalmic surgeons that there is no section of medical science respecting which the profession, as a body, possess so limited and imperfect a knowledge, as diseases of the eye. It is frequently our painful duty to have cases brought to us, in which vision has been permanently damaged, and even destroyed, where an early recognition of the nature of the disease, and prompt and suitable treatment, would have insured the safety of the organ.” “It often depends on the surgeon whether the patient shall retain or lose, recover or remain bereft of vision. Common external inflammation of the eye, if neglected or improperly treated, by rendering the transparent anterior portion of the organ more or less opaque, proportionally injures vision, inflammation of the iris, when unchecked, causes contraction of the pupil and effusion of lymph, which prevents the passage of light into the eye.” †

The young practitioner should employ his early years of professional life, when he has most leisure for reading and study, in the acquisition of such knowledge as, in after years when more pressed for time, shall aid him in the intelligent discharge of his professional duties. He should take every opportunity which hospitals afford to study the diseases of the eye in the living subject, and compare and contrast them under the guidance of the matured judgment of the older professors, who are always attached to good hospitals or eye infirmaries. There

\* Gritchett’s Lectures on Diseases of the Eye.

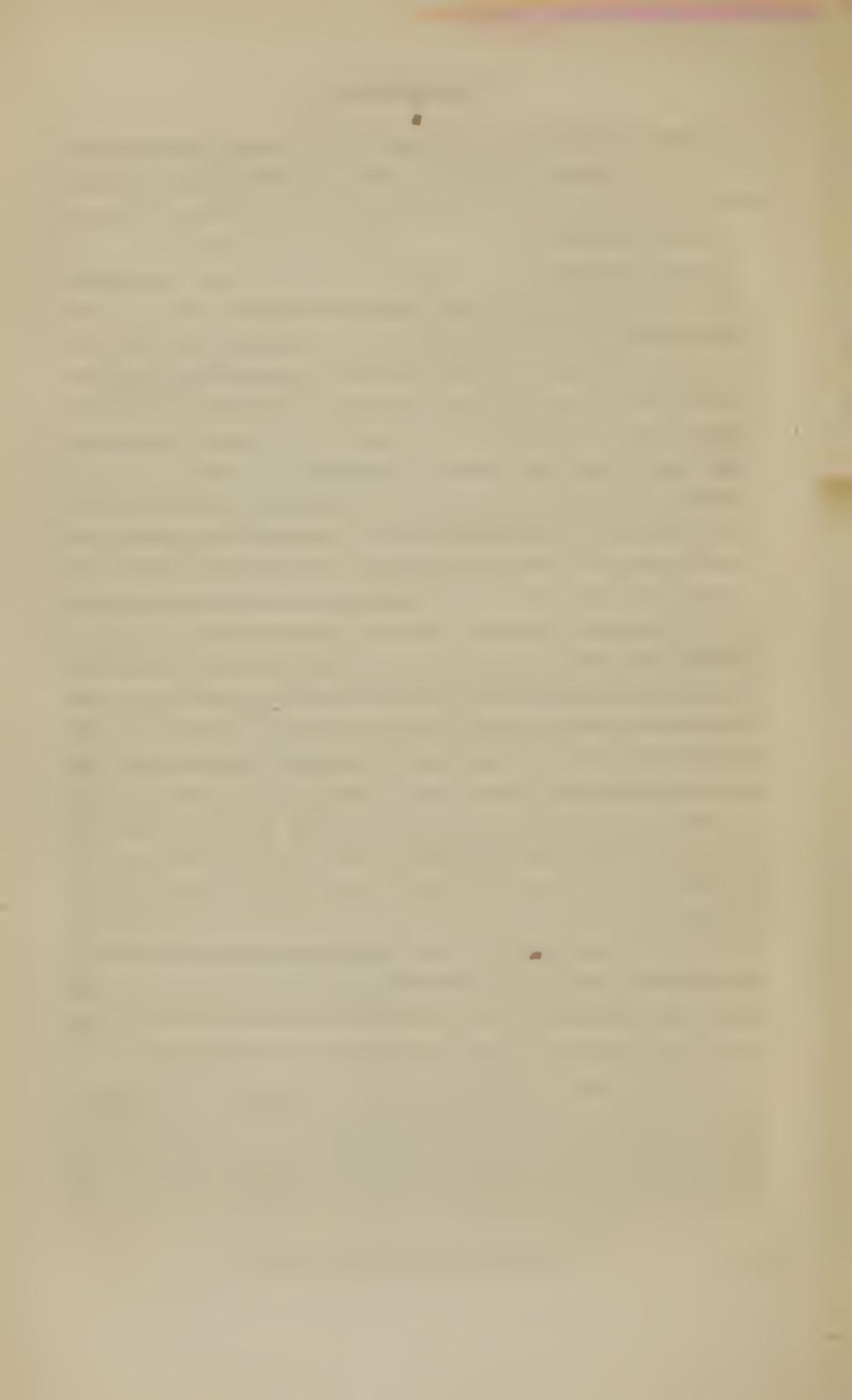
† Lawrence on the Diseases of the Eye.

are several excellent institutions of this character in our country,\* where every facility is enjoyed by the student for seeing and studying the various characters of the diseases to which the eye is subject.

Every disease of the eye presents some differences, depending upon the nature of the disorder itself, and others, arising from the peculiar organization of the texture which happens to be principally affected; the characteristic appearance of ophthalmia must be subject to a vast number of modifications, according to the particular structure which is inflamed; and, hence, sometimes one symptom of inflammation, and sometimes another chiefly predominates, while others are less conspicuous, and often scarcely distinguishable. Yet, says Beer, none of the characteristic marks of inflammation are ever entirely absent.

I will conclude this introductory section with the true remark of Dr. Lawrence, (whose work on Diseases of the Eye, and particularly Dr. Hay's edition, I cannot too highly recommend to those who wish to obtain further knowledge,) who says, "If there are any to whom the pleasure connected with the acquisition of knowledge, the satisfaction flowing from the consciousness of important duties rightly performed, and the gratitude so warmly expressed for the inestimable benefits of averting blindness or restoring sight, should not prove an incentive sufficiently powerful to the study of ophthalmic medicine and surgery, their case must be deemed desperate; unless, indeed, their minds, insensible to higher feelings and nobler motives, should obey the impulses of self-interest and fear, unless they should be affected by the prospect of disgrace and injury, which ignorance and inseparable blunders must entail."

\* I can, from personal observation, speak most highly of the Boston Eye and Ear Infirmary, in charge of Drs. Hooper and Bethune, two of the best oculists in this country. I will take this opportunity to express my thanks to those gentlemen for their kindness towards me during my stay for several months in Boston, when I daily attended with them during their professional hours in that institution, and was much gratified with the medical and surgical treatment I daily witnessed both on the eye and the ear.



GUIDE  
TO  
DISEASES OF THE EYE,  
AND THEIR TREATMENT.

---

PART FIRST.

SECTION I.

OF OPHTHALMIA, OR INFLAMMATION OF THE EYES IN GENERAL.

THE eyes and their appendages, like every organized part of the body, are liable to inflammation; and the symptoms produced by this affection vary according to the particular seat of the disease. Thus the symptoms attending an inflammatory affection of the retina and other deep-seated parts, are different from those which occur from inflammation of the external coverings of the eye; and these again are very different from those produced by an inflamed state of the eye-lids.

The symptoms which most frequently take place in inflammatory affections of the eye, are a preternatural redness of the adnata, (conjunctiva,) owing to the superabundance of its blood vessels; pain and heat over the whole surface of the eye, attended with a sensation similar to that caused by sand or some other extraneous body between the palpebræ and the eye-ball. And in most instances there is a plentiful effusion of tears. All these

symptoms are commonly increased by motion of the eye, or of its coverings, and likewise by exposure to light. We judge, too, of the depth of the inflammation by the degree of pain induced by light thrown upon the eye. When the pain produced by light is considerable, we have much reason to suppose that the parts at the bottom of the eye, and especially the retina, are chiefly affected; and, vice versa, when the pain is not much increased by this kind of exposure, we conclude with much probability that the inflammation is confined chiefly or entirely to the external coverings of the eye. In superficial affections of this kind, too, the symptoms are in general perfectly local, but whenever the inflammation is deep-seated, it is attended with shooting pains through the head, and fever to a greater or less degree commonly takes place.

During the whole course of the disease there is, for the most part, a very plentiful flow of tears, which frequently become so hot and acrid as to excoriate the neighboring parts; but it often happens, after the disease has been of some duration, that, together with the tears, a considerable quantity of yellow purulent-like matter is discharged; and when the inflammation has either spread to the eye-lids, or has been seated there from the beginning, as soon as the tarsi becomes affected, a discharge of a viscid, glutinous kind of matter takes place, which adds greatly to the patient's distress, as it tends to increase the inflammation, by cementing the eye-lids so firmly together as to render it extremely difficult to separate them.

This is the appearance usually exhibited by inflammation of the eyes in the first stages of the disorder; but when the disease continues violent, notwithstanding the use of any remedies that may be employed, like inflam-

matory affections of other parts, it progresses to a termination either in suppuration, or in obstruction or induration of some part of the membranes of the eye. If the disease be very violent, and suffer from neglect or inattention, blood is sometimes effused into the anterior or posterior chambers, or the eye-ball runs on to suppuration. The globe is much enlarged and protrudes to some distance out of the socket, giving rise to what has been termed the *phlegmone exaphthalmica*. This state is accompanied with a high degree of sympathetic fever; the pulse is frequent and hard, the tongue is furred, and the appetite much impaired. The cornea, which at first possessed a shining lustre, is now rendered dim and opaque, or ulcerates and sloughs, so that the contents of the eye are more or less discharged. The eye-ball at length collapses, and the vision is completely destroyed.

The causes which induce inflammation of the eyes are manifold. The following operate most frequently: an impure atmosphere, trichiasis, bodies falling into the eye, too intense a light, or a sudden change from darkness to light. Inflammation of the eyes in a particular manner occurs readily when the eyes are often and long exposed to the immediate reflection of light from very white objects. In like manner, all over-exertion of the eyes, and wounds with sharp or blunt instruments, congestion in the head, and particularly in the eyes, from pressure of the bowels by coughing, loud crying, neckcloths too tightly applied, suppressed fluxes of blood—e. g. hemorrhoidal, menstrual and nasal—must not be forgotten as causes of pure ophthalmia. Even the irritation of cutting teeth in children, or of carious teeth, may produce a pure ophthalmia.

The prognosis depends on the intensity of the inflammation on the particular part affected, and on the particular cause; as also, on the early or late call of medical aid. Slight external idiopathic inflammation may often be resolved without bad consequences, and will disappear by the use of simple means. Inflammation of the eyelids runs a more tedious course, in general, than that of the eyes themselves. Inflammation of the internal structures of the eyes is much more likely to result in perfect or imperfect destruction of vision, than external superficial inflammation; which latter, on the other hand, more frequently indirectly limits or hinders vision by organic obstacles; for example, by leucoma, staphyloma, &c. Inflammations which attack the whole eye-ball, which is often the case after deep wounds, proceed almost always to suppuration or even to gangrene.

Before I enter upon the treatment of inflamed eyes in general, and upon a description of the various diseases of the eye, it will be useful to give a few practical hints with regard to the method to be adopted in examining this delicate organ; also, some general observations respecting the medical means most commonly in use in the local treatment of the various forms of ophthalmia. In making an examination of so sensitive an organ as the eye, more particularly when inflamed, extreme delicacy and lightness of touch are necessary. The patient having been placed opposite a good light, the upper eyelid should be raised by placing the thumb gently upon its free or ciliary margin, and then it should be lifted toward the edge of the orbit, so as not to press upon the globe; at the same time, the lower lid may be depressed by the forefinger of the other hand. In this way the eye may

be fully exposed in spite of some intolerance of light and spasm of the orbicularis musele, without any undue force or pressure upon the globe, and without the possibility of the eye closing, except with the consent of the surgeon. Having, by inspection, which must be done with the greatest accuracy, and yet in as short a time as possible, learned all that is required to know of the leading features of the ease, which are styled "objeetive symptoms," it is desirable in the next place to inquire into those symptoms of which the patient is cognizant, termed "subjective symptoms." For the examination of the eyes in children, especially when affected with intolerance of light and blepharospasmus, considerable management is required, and even some degree of gentle force.

The surgeon is to seat himself in a chair, with a towel, folded lengthwise, laid across his knees. On another chair, on the surgeon's left-hand and a little in front of him, the nurse, with the child, sits in such a way that, when she lays the child aeross her lap, its head may be received on the towel and between the knees of the surgeon, and there held steadily. The nurse now confines the arms and hands of the child, whilst the surgeon having dried the eyelids with a soft linen cloth, proceeds to separate them by applying the points of the forefinger of one hand to the border of the upper eyelid, and the point of the thumb of the other hand to the border of the lower, and then sliding them against the eye-ball, but without pressing on it, towards their respetive orbital edges. This mode of proceeding obviates the eversion of the eyelids, whieh is so apt to take place under the eircumstances. The eyelids being thus opened, they are easily kept so during the examination, by the command whieh the points

of the finger and thumb, resting against the edges of the orbit, have of their borders.

By this means the whole front of the eye-ball is exposed, but it often happens that, to avoid the light, the eye is spasmodically turned up, so that the cornea is in a great measure concealed. By waiting a few seconds, however, enough of it will in general come into view to enable the surgeon to judge of the condition of the eye.\*

In the treatment of inflamed eyes, the indications to be kept in view, are to remove any extraneous substances by which irritation may be produced on the eyes or on the eyelids. Fine dust, when it first enters the eye, will often be easily removed by washing the eye with water, or syringing it with the same. If nothing is visible on the bulb, the upper lid should be everted; this can easily be done by laying hold of it and gently pulling its ciliae with the finger and thumb of the left-hand, whilst with a probe a slight counter-pressure is made on the skin of the eyelid at the upper edge of the tarsal cartilage, which, it will be recollect, is nearly four lines broad at the middle part of the eyelid. These two opposing forces immediately produce an eversion of the eyelid, and the conjunctiva of the superior palpebra becomes exposed, and in very many cases a black particle of dust will be observed upon it, which can be readily removed. If the foreign body has penetrated firmly into the conjunctiva of the palpebrae of the sclerotica or of the cornea, it may be easily removed by fine spatula. But if hard pointed particles have penetrated the internal surface of the eyelid, the cornea or other parts, they must be carefully extracted

\* On the objective exploration of the eyes, read Jones on the Eye, edited by Dr. Hays, from page 19 to 27.

by means of a lanceet-shaped needle or by fine forceps. If the foreign bodies have wounded the conjunctiva and be in part covered by it, so that they cannot be extracted by means of the foreeps, it will then be best carefully to elevate the wounded conjunctiva by means of a fine foreeps, and to cut a portion of it out, around the foreign bodies, by which means they are not only removed, but the lacerated wound of the conjunctiva will be converted into a clean incised wound.

If the inflammation be very severe in degree and extent, if inflammatory fever arising from it be present, then general blood-letting, repeated when necessary, is urgently indicated; and here, where we have to do with the existence of a most precious organ, it is even advisable to perform the bleeding in the temporal artery or the external jugular vein, and to a sufficient extent. In less severe inflammation of the eyes, without fever, or when it appears to arise from irritation of an external cause, and recedes as soon as this is removed, leeches are sufficient; which, from three to ten or more in number, must be applied on the temple, or under the internal canthus, and around the whole eye, being careful not to place them too near the eye-lids, since afterwards considerable swelling and effusions of blood in the eye-lids are often observed, which may increase the inflammation by their irritation. Bleeding also from the vena angularis, from eight to twelve ouncees, is here very suitable, and even in very severe ophthalmia often produces very rapid alleviation of the symptoms.

If the ophthalmia arose from congestion produced by suppressed menstruation, haemorrhoidal or nasal haemorrhage, then the extraction of blood will be best performed

at the place in which the disease originated ; hence leeches are applied on the labia pudendi, around the anus, or on the alæ of the nose.

An ophthalmia sometimes shows itself in infants as a consequence of difficult teething ; in such cases the gum over the advancing tooth should be divided by two incisions, crossing each other. Certain benefit is not often to be expected from this. Leeches applied on the gum of the suspected tooth have even been recommended.

Along with the general and local bleeding, we must not neglect an antiphlogistic diet, antiphlogistic mixtures of nitre, lukewarm pediluvia, clysters, and rest of the eye by enjoining darkness of the patient's chamber, and the use of a green shade. Fomentations of cold water, applied by means of linen compresses, from four to eight ply thick, diminish the great heat and pain, and aid the cure considerably. Sometimes a pure ophthalmia is combined with an œdema of the upper eye-lid, in consequence of which a proper examination of the eye is rendered impossible ; in this case two punctures with a lancet may be carefully made in the skin of the eye-lid, near to its edge, on which, after a bloody water has flowed out, the swelling decreases, and the necessary means may be better applied.

Mild pure ophthalmiæ often require no detraction of blood, for after the remote cause has been removed, we may use cold water or poultices of oxyerat, (a mixture of vinegar and water,) or mild mucilaginous eye-waters, by the application of which they for the most part are made to disappear in a few days. The following is very good :

Rx      Muc. Sem. psyll.  
          Muc. Cydonior, a ʒ i  
          Aq. Rosar.        ʒ ij        M.

When the inflammation has been partly subdued by the above mentioned means, most oculists recommend poulticing the eye with different emollients, for example, with loaf bread and milk, boiled with some saffron, or flor. verbasc. c. croco orient., or the capita papaverum, etc. We must not forget, however, that there are many persons so irritable, that their inflamed eyes cannot bear the slightest pressure, and in whose cases, therefore, in place of these poultices, we may use, with great advantage, emollient, anodyne, and moderately warm fomentations. Such poultices and fomentations may be repeated often daily, as every two or three hours. As these poultices are very useful when preceded by sufficient blood-letting, so in like manner are blisters, which, however, when the phlogosis in the eye is yet great, or when it is very irritable, must not be applied too near to the eye, e. g. on the temple, etc., because the blister in this case would not always act as a derivative or counter-irritant, but would rather increase the irritable state of the eye, on which account, apply the blister according as the sensibility of the eye is greater or less, either at a greater distance, on the arm or neck, for example, or on nearer parts, as behind the ear. When a local debility of the vessels of the eye has commenced, the emollient poultices must on no account be continued, but recourse had to other remedies, such as the "*laudanum liquidum Sydenham.*" This is one of the most preferable medicines. It is used locally by allowing a drop of it to fall between the eye-lids, once or twice daily. It increases at first the pain and lachrymation of the eyes, and augments the number of blood-vessels when they can be seen—but these effects are soon followed by decided relief. In

severe inflammation of the eyes, when as yet no evacuations of blood have been premised, this medicine proves injurious, and increases the inflammation.

Astringent applications can now, for the first time, be applied, when a sufficient antiphlogistic treatment has been used, and a local debility of the vessels of the eye has commeneed. They may consist either of eye-waters or salves.

If the inflammation become chronic, a decoction of willow bark, with or without some drops of *laud. liquid. Syd.*, is often of real service. The inflammations of this stage often yield to the use of an eye-water composed of *plumb. acet. aqua distill. seu rosarum*, with some drops of *spt. camphor*, or the use of the *aqua ophthalmica conradi*—

Rx	Mercur. sub. corr.	gr. i
	Laud. Liquid. Sydenh.	3 ij
	Aqua Rosarum,	3 vi.
		M. solvendo.

In like manner solutions of *sulphate of zinc* and *alum* are frequently used.

Astringents in the form of salves are also used in pure inflammations, particularly, however, when the inflammation has become very chronic.

During the use of these medicines, restore the eye to its hitherto unnecessary, but formerly customary influences, according to its existing state of sensibility; expose the eye therefore to the action of free, dry, warm air, and if the inflammation advances to suppuration, let the eye have as much light as it can pleasantly bear, and let it be employed with the observation of agreeable objects, and so forth. This will contribute much to the healthy suppuration.

If the suppuration extend, or if bad ichorous suppuration take place, then it becomes highly necessary to assist by art the powers of restoration, so as either to bring about, as soon as possible, a healthy suppuration, or to limit it when too great. This is accomplished by the local application of tonic medicines, particularly volatile ones, suited to the debility of the eye, and by gradually omitting them as soon as the unfavorable is changed into a favorable suppuration. Use also dry warmth when necessary, with the addition of camphor, also bags of dried aromatic herbs with camphor

Bags of aromatic or narcotic herbs, placed over the eyes, are employed partly to keep up dry warmth, and partly for the sake of the exhalations they give out. The bags are made of coarse lawn or muslin, washed and rubbed soft. Being loosely filled, the bag is sewed close, and then quilted at different places, so as to keep the materials equally spread out, and to prevent them from sinking down. The bags ought to be made as light as possible, not more than the thickness of a finger, and about the size of a play card. They are fixed to a band passed round the forehead, so as to hang free; they ought not to be bound over the eye. The bags should be warmed before being applied.

*Examples of materials for herb bags.*

Rx Flor. Chamomill,	Rx Pulp. hb. Belladonnæ,	5 i
Flor. sambuc. à à p i	Farin. amygd. dulc.	3 i
Farin. fabarum. pp ij	M. F. Pulvis.	
M. F. Pulvis.		

We also use advantageously warm poultices of crumbs of bread and aromatic herbs and of pulp of apples. Moist poultices, however, must never be allowed to become cold upon the eye.

If small ulcers exist upon the eye-ball itself, the dropping into the eye and bathing it with a lukewarm solution of *lap. divinus*, with the addition of *laud. liq. Syden.*, is very efficacious. If bad ichorous suppuration extend notwithstanding, the suppurating spots are to be smeared over once or twice daily, according to the degree of danger, with the *laud. liquid. Syd.* In the most urgent cases the *laud. liq.* may be mixed with some *balsam vit. Hoffm.*, *vitriolic aether*, or *Peruvian balsam*, in small proportions, only these means must not be used to excess, otherwise fleshy excrescences form, which when actually present must be destroyed by caustic or burnt alum. No changes of structure arising in the first stage are ever to be treated with escharotics so long as the suppuration continues, and those abscesses only which lie too deep to allow a hope of their opening of themselves, may in this stage be opened with a lancet at their most depending part. If a suppurative fever attend the suppuration, a nourishing diet is to be prescribed, with volatile stimulating medicines, e. g. *Calamus aromaticus*, *camphor*, *aether*, &c. Let bark be given, and produce a derivation of the diseased tendency from the eye, by means of rubefacients applied at a little distance from it.

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## SECTION II.

### INFLAMMATION OF THE CONJUNCTIVA.

No organ in the body presents so favorable an opportunity as the eye for observing the varieties of the inflammatory process which depend on difference of struc-

ture. It contains specimens of all the animal tissues, and these are, for the most part, immediately open to our observation, so that the study of ophthalmic diseases constitutes an epitome of general pathology. In this point of view, nothing can be more interesting and instructive than an observation of the varieties presented by inflammation of the *Conjunctiva*, *Sclerotica*, *Cornæa*, *Iris* and *Retina*.

#### CATARHAL OPHTHALMIA.

The most simple form under which inflammation attacks the Conjunetiva is that of Catarrhal Ophthalmia.

The principal circumstances predisposing an individual to catarrhal ophthalmia are original constitutional debility, enfeebled health—whether arising from actual sickness, defective nourishment, or a disproportionate drain upon the system, (as in cases of superlactation.) There having been a former attack of the same malady, the vernal and autumnal seasons, etc. The direct or exciting causes consist of casual exposure to damp and cold, in any of the many ways in which such exposure continually occurs. Wet feet, damp beds, chilling currents of air, an open or broken window in the sleeping apartment, immersion in water, and circumstances similar to these, the ordinary exciting causes of common catarrh, are the usual originators of this species of it.

*Symptoms of Catarrhal Ophthalmia.*—Stiffness and smarting, some uneasiness on exposure to light, watering, and external redness, usher in the attack. When fully developed, it is characterized by redness and increased mucous, not lachrymal, discharge; the pain is inconsiderable, and there is little or no intolerance of light

The redness in catarrhal inflammation is superficial, and of bright scarlet color, forming a striking contrast to the rose or pink tint which belongs to inflammation seated in the proper external coat of the eye. The distended vessels are quite superficial and of a scarlet color ; they may be readily pushed aside by moving the lids. The trunks are seen at the circumference of the globe ; they run forward in tortuous course, subdividing and inoseulating as they approach the cornea. The redness is generally irregular, in patches, some fascieuli of vessels being more filled than others ; hence the membrane has a mottled appearance ; however, in the fullest development of this affection, the whole surface becomes of a light red. The redness begins at the circumference of the globe and gradually advances towards the cornea, but in the commencement it is confined to the palpebral conjunctiva, or to the angle of reflexion. Sometimes, beside the redness resulting from vascular congestion, especially if the inflammation be severe, we see red patches in the conjunctiva ; these are spots of ecchymosis, small quantities of extravasated blood, and such appearances denote activity of the inflammation. Sometimes there are little vesicles, called pustules, on the conjunctiva, slight elevations of the membrane, containing a serous fluid, and usually appearing about the margin of the cornea. Unless the affection be severe, with general redness and some thickening, the sclerotica may be seen through the inflamed conjunctiva, especially round the cornea, of its natural white color.

Catarrhal inflammation seldom produces much swelling of the conjunctiva ; nothing like the state of ecchymosis is incidental to the more acute inflammation of the mem-

brane. The only approach to such an appearance is a slight serous effusion, raising the mucous membrane from the scleroteca into a loose elevation. The pain in the commencement of the affection is not considerable, except in severe cases, the patient complaining rather of stiffness, dryness, or of a sensation as if sand or gravel had got into the eye. The intolerance of light is slight at first, and after a time the patient hardly complains of uneasiness, and opens the eye freely to the light, even when there is considerable redness. The feeling as if a foreign body were in the eye, which is so commonly experienced in conjunctival inflammation, appears to be produced by the partial vascular distension, and consequent inequality of surface and mechanical irritation on motion. If the fullness of the vessels is lessened by bleeding, the sensation subsides. When the lachrymal discharge observed in the commencement eases, its place is supplied by increased secretion of mucus from the inflamed membrane itself; this is at first thin, and as the inflammation goes through certain changes it becomes thicker, assuming a whitish or yellowish appearance and sometimes putting on a character approximating to that of pus. This increased mucous discharge distinguishes the catarrhal form of inflammation. Its quantity will depend on the degree and extent of inflammation. It may be just sufficient to collect in small quantity at the corners of the eye; a whitish streak may be seen on the inside of the lower lid at the angle of reflexion; there may be enough to form more or less copious incrustation about the cilia, and to agglutinate the edges of the lids at night, or it may constitute a copious muco-purulent discharge, hardly distinguishable from that of mild purulent ophthalmia. The eye-lids

participate, more or less, whenever there is active catarrhal inflammation of the eye.

Other mucous membranes suffer when there is severe attack of this inflammation ; hence pain and sense of weight about the frontal sinuses and antrum. Under such circumstances there is more or less of catarrhal fever, chills, heat, headache, disordered stomach and foul tongue, with impaired appetite or sickness. Such a state of stomach may cause inflammation of the conjunctiva, bearing all the marks of a catarrhal character, without any atmospherical influence.

The symptoms of catarrhal ophthalmia, both local and general, remit by day, and undergo exacerbation at night. During the day the redness is less ; there is no pain nor intolerance of light ; the eyes become sore and uneasy in the evening, smarting and burning, with increased redness and mucous secretion.

*Prognosis.*—If catarrhal ophthalmia be neglected, or treated only with general remedies, or with improper local ones, it will continue for many weeks, and become the cause of much febrile excitement and constitutional illness, as well as local distress and danger. Among other bad effects of neglect, the conjunctiva, particularly where it lines the upper eye-lid, becomes sarcomatous and rough, and by rubbing in this state against the cornea, renders it, and especially the upper half of it, vascular and nebulous, or even densely opaque. The discharge from the conjunctiva is apt, also, under neglect or improper treatment, to become thicker and more opaque, and to show a power of propagating the disease by contact.

We have now to consider the treatment of this affection. I have been particularly anxious clearly to define

this disease, because, if correctly diagnosed and attacked early, it may be cured rapidly and almost invariably by local stimuli; and of these, by far the best, according to my own experience and that of the best oculists, is a weak solution of the *nitrate of silver*, in strength about three grains to the ounce of distilled water gradually increased to six or even ten grains. A large drop or two is to be applied to the eye once or twice or thrice a day, according to circumstances, by means of a pretty thick camel hair pencil. In severe cases let it be repeated every three hours. It causes a slight smarting, but it subsides in ten minutes and the patient feels great relief.

The patient experiences much relief from fomenting the eyes with warm water or warm poppy decoctions, as a fomentation or collyrium. I am in the habit, however, of employing a solution of one grain of *corrosive sublimate* and *six grains of muriate of ammonia*, in *six ounces of water*, to a table-spoonful of which, at the time of being used, is to be added an equal quantity of boiling water. This diluted solution is to be used thrice a day for fomenting the eyelids, by means of a folded piece of linen or flat soft sponge. In mild cases, a few drops are allowed to flow in upon the eye; but in severe cases, in which the discharge is copious and puriform, the collyrium must be injected over the whole surface of the conjunctiva, and especially into the upper fold of that membrane, by means of a syringe, so that the morbid secretion may be entirely removed and the diseased membrane touched immediately by the solution. Great relief is obtained in all the puro-mucous ophthalmiae by the removal of the discharge, the feeling of sand in the eye being in a great measure caused by its presence.

At bed-time, about the size of a barley-eorn of red precipitate ointment, melted on the end of the finger or a camel hair pencil, is to be smeared along the edges of the eye-lids. The ointment, as prepared, consists of 12 to 20 grains of *red precipitate*, carefully levigated into an impalpable orange powder, and mixed with one ounce of butter or lard, free from salt. If the local symptoms do not speedily yield to the remedies already mentioned, from 6 to 12 leeches may be applied, two or three over the nasal vein, and the rest over the temple or eyelids. A brisk dose of calomel and jalap may be ordered at the commencement, with occasional doses of neutral salt during the course of the disease.

In very severe cases, a blister to the back of the neck or behind the ears, kept open, will be found useful.

*Regimen.*—The patient should use a mild diet, without fermented liquors, avoid reading and writing, shade the eyes from bright light, and go early to bed.

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### SECTION III.

#### SCROFULOUS OPHTHALMIA.

THE species of Ophthalmia, termed strumous or scrofulous, is the most common form of ophthalmia in children of from one to twelve years of age. Infants at the breast are rarely if ever attacked, but from suckling to puberty —more especially during the earlier part of this interval it is most common. The reason would seem to be that, superadded to the natural delicacy of a child's frame at this early age, the digestive organs in particular are feeble in their power and easily disordered. An infant has

recently been alienated from the blandest nourishment which nature can afford ; its primæ viæ are but just adequate to the digestion of light farinaceous substances, and those which approach most nearly in their irritating qualities to milk. Yet precisely at this time, when the indications of nature and common sense combine in their recommendation of a simple dietary, from motives of mistaken kindness, or to lull the child's shrill vociferations, unwise indulgent nurses are prone to pamper it with confectionery, raw fruits, the stronger meats, and (too frequently among the poorer classes) with actual spirit.

I believe strumous scrofulous ophthalmia to be an affection simple in its character, depending in the generality of instances upon disorder of the digestive organs, influenced by the age of the patient, and presenting a certain type peculiar to diseases of the earlier period of life, that it is not restricted to scrofulous children in particular, but that it attacks any child however strong and healthy his previous condition may have been.

Mr. McKenzie, who regards the disease as eruptive, observes that it is one to which children are so liable, that out of one hundred cases of inflammation of the eyes in young subjects, ninety are of this kind ; and he adds—“This ophthalmia is very often the first manifestation of a scrofulous constitution.” On page 417 he says: “The scrofulous constitution may be regarded as the chief remote or predisposing cause of this ophthalmia.”

Mr. Jones says : “ Although the subjects of it often present the scrofulous diathesis in a well marked manner, and not unfrequently are laboring at the same time under scrofulous affections of other parts, it is to be re-

membered that cases frequently occur in which there are no such evidences of scrofula. Unless, therefore, we choose to view, as some do, this form of ophthalmia itself as a manifestation of serofulous constitution, the term ‘serofulous ophthalmia’ must be received rather in conventional than in literal sense.”

Mr. Tyrrell remarks: “I do not consider that there is an inflammation of the conjunctiva peculiar to” scrofulous persons, but that the ordinary affections which I have described are all occasionally modified by the peculiarity of constitution, which is denominated serofulous or strumous. I have quoted the opinions entertained by various writers on this subject, as preliminary remarks, in order to carry out the idea of Mr. Hancock, who says, ‘We are not justified in asserting that a disease is serofulous, merely because it is characterized by certain symptoms supposed to proceed or lead to the deposit of tubercle, if those symptoms are capable of inducing other results, or if being arrested or removed altogether without such tubercle being developed; and for this reason we cannot agree with those writers who regard this form of ophthalmia as a sign *per se* of the serofulous diathesis, and who consequently assert that it is sometimes the first manifestation of that condition of constitution.’ If this form of ophthalmia be so dependent upon scrofula, how is it that its attacks are so restricted by age? How is it that it does not proceed *pari passu* with that disease? We rarely meet with the so-called strumous ophthalmia after the age of twenty, whilst the very large majority occur in children under ten. Scrofula does not limit itself to these periods of life, and how very rarely does this affection of the eye accompany the most confirmed of all serofulous

diseases, *phthisis pulmonalis*. If the relation between the two diseases were so intimate as is insisted upon by the generality of authors, we have every right to infer that the one would not be confined to the first fifteen or twenty years of life, whilst the other, upon which it is said to depend for existence, is bounded by no such limits, still less would we expect such complete immunity from the ophthalmic affection as obtains in phthisis, where the serofulous development may be said to have attained its climax. At peculiar ages there are peculiar conditions of eonstitution ; at the period of childhood, whether the process of development going on requires or produces excited action, or whether full vigor is not as yet attained, a condition of excitement, debility and irritation obtains, which more or less influences and controls the affections to whieh children are liable, whether of the eye or elsewhere. We should not confound this condition, which is the common lot of all, with a specific disease, as is virtually done by designating these cases ‘serofulous ophthalmia;’ if so, we do neither more nor less than declare that scrofula is inherent in the constitution of all, and that no one is free from its taint. Those diseases of the eye whose origin can fairly be traced to scrofula, presenting symptoms and appearances peculiar to themselves, ought to be called ‘serofulous ophthalmia,’ in the same way that we designate particular affections of the *iris* syphilitie, or rheumatic *iritis*, but we ought to be careful not to apply a term of specific signification to a disease of a general character, as by so doing we mislead and do mischief, since specific diseases are too frequently treated according to their designations rather than to their actual character and symptoms.”

A little practice will enable you to recognize strumous ophthalmia without difficulty; for its symptoms, which I shall now investigate, are palpable.

The actions and general appearance of a child will commonly denote the nature of the malady from which it suffers, even before the affected organs are examined. If it be in the arms of its nurse or mother, it will twist itself round and bury its face upon her shoulder; if it be led, it will walk with its face towards the ground, or buried frequently in its attendant's dress; it will shuffle towards you, and when the face is exposed, the muscles appear to be acting towards a given point, that point being the eyes; it will adopt every means which instinct can suggest to shield the affected organs from the most feeble rays of light. The scalp, forehead and eye-brows are drawn forward, the latter overhanging the orbit; the muscles of the upper lip and sides of the nose are powerfully exerted, so much so that when the affection is of long standing, these parts are more or less deformed, the nose becoming turned up and widened at its extremity, and the upper lip rendered prominent, and also drawn upward, whilst, when the intolerance of light is severe and has existed for some time, both eyes being affected, the aperture of the mouth will be increased from side to side, from the powerful and long continued action of the muscles upon its angles. The orbicularis palpebrarum and albinus muscles contract most powerfully and spasmodically, turning the tarsal margins inward, and sometimes to such an extent that complete ectropium obtains, and the lids approximate, not by their tarsal margins, but by their investing cuticle or skin; whilst the profuse discharge of hot and acrid tears, continually flowing over the

lids and cheeks, producing excoriation, increases the suffering, and is said to give rise to the porriginous eruption, so frequently the accompaniment of this affection. If we attempt to open the eyes,—and it will not be out of place to remark that it is an unnecessary act of cruelty, and one which may usually be dispensed with to the benefit of the patient,—often are the most skillful and experienced baffled in such examinations; they go through the form, but as for obtaining any information, they may spare themselves the trouble and the child the torment, which lies screaming and struggling to prevent the lids being separated; but if you have even succeeded, you will usually find the skin of the lids, where it is turned in and approximated, excoriated and covered with viscid mucus, and also a fissure or crack at the outer canthus of the lids, which bleed under the forced examination. The Schneiderian membrane is inflamed, and pours out a constant and increased secretion from the nostrils, which, running over the upper lip, irritates and excoriates the latter, whilst the child, continually rubbing its eyes and nose, spreads the tears and nasal mucus over the cheeks, increasing the irritation of those parts, and rendering them stiff and dirty. Frequently there is a breaking out at the angles of the mouth, by the side of the nose, on the chin, behind the ears, and in the external ears themselves. The skin is hot, dry and harsh, or it may be cold and clammy; tongue coated with fur, and having prominent red papillæ; breath offensive, sour; abdomen large round and tumid; the liver, when pressed upon, is commonly found enlarged and tender; bowels disordered and irregular, sometimes constipated, at other times relaxed, the secretions being dark or clay-colored, but mostly

offensive. At times the child will pass a large quantity of pale, limpid urine, at other times it will be highly colored, small in quantity and very irritating in its passage.

*Treatment.*—In order to conduct the treatment upon sound principles, our first attention should be directed to remove the cause whence the outward manifestation of disease derives its origin. The first indication therefore in the cure is to give strict rules respecting the food, clothing and general care of the little patient. His food should be of a nourishing but bland and unirritating description. For young children farinaceous substances, with only an occasional admixture of animal preparations, are best. Mr. Lawrence says: “Regulation as to quantity and quality of food and number of meals is very important; it is an error often committed, not only by patients, but even by medical attendants. The notion has been entertained that scrofula consists in debility, and hence the inference has been drawn that it is to be remedied by the free use of animal food and fermented liquors, of tonic and stimulating medicines. This view seems to me altogether erroneous, and the practice decidedly injurious. A warm bath, to promote proper cutaneous action, may be ordered once or twice a week, early hours, and moderate exercise. Obedience to these rules should be strictly enforced, for if they are violated you may try in vain to overcome a disease, the causes of which remain in continual operation.

Next to withdrawing the cause of disease, comes the removal of their effects. This you will accomplish by due attention to the principal secretions. The bowels must be regulated\* by occasional alterative mercurial doses,

in combination with a purgative or antacid, according as constipation or diarrhoea prevails. We generally use, to fulfil this indication, powders of mercury with chalk and rhubarb, and the soda powder with mercury, of Guy's *Pharmacopœia*. The former may be given in proportion to the age of the individual, twice a week, or every other night, should constipation be obstinate. Ten grains contain three of the gray powder. The soda powder, with mercury, may be given in the same way; eight grains consisting of a grain of calomel, two and a half grains of dried carbonate of soda, and five of compound chalk powder. If the inflammatory action be acute, and the child possess moderate power, it is sometimes well to produce rather active purging at first; and with this view, besides the powder just mentioned, infusion of rhubarb with magnesia may be given as required. It is in the majority of cases preferable to refrain from active purging, but to exhibit a mildly aperient alterative as above recommended, and combine the same with some gently tonic medicine as the Guy's compound rhubarb julep. Half an ounce of this, the average dose for a child, consisting of four grains of calumba, two grains of rhubarb, and two of dried carbonate of soda, in mint water. So soon as the evacuations have resumed a healthy state, have become regular in period and normal in character, and the tongue has become more clean, more decided tonics may be resorted to with advantage, though considerable inflammation be still present in the conjunctiva. The disulphate of quinine is especially useful, and occasionally the addition of some drops of diluted sulphuric acid to the mixture containing it will be found very serviceable. Should there be difficulty in getting the child

to take this, the same active ingredients may be given in a teaspoonful or two of syrup. In cases where, from the general torpidity and feebleness of constitution, and the indolence of the local disease, a more stimulant plan seems indicated, the sesqui-carbonate of ammonia may be ordered thrice daily; while, should there still remain inactivity of the bowels, a few grains of the compound rhubarb powder may be given with each dose of the ammonia. In the convalescent stage, when the little patient only requires restored tone, iron in conjunction with ammonia proves most beneficial.

The plan of constitutional treatment just laid down is so uniformly successful, that I habitually adopt it in routine cases. It occasionally happens, however, that although the marks of gastric and intestinal disorder have been removed, still the local disease continues unabated in intensity, so that a resort to tonics is evidently out of the question, or, if tried, the experiment is sure to fail of any good effects. Now, under these circumstances, the exhibition of antimonial medicines is one of the most promising means of effecting a cure. The potassium-tartrate of antimony may then be given in doses proportioned to the age of the subject, thrice daily, its diaphoretic effect being promoted by combination with acetate of ammonia, by the occasional use of the warm bath, and particular attention to warm clothing. I have seen strikingly good effects result from this plan.

Another valuable remedy, *cod liver oil*, like the last mentioned, is, in my opinion, principally eligible when the ordinary means previously described have failed, and is far from being entitled to supersede them in routine practice. The *iodide of potassium* again deserves a trial in intractable cases; I have known it prove beneficial.

Mr. Hancock, with whom I mostly agree, says:—

The treatment should commence with an emetic of *tartrate of antimony*, given as advised by Mr. M'Kenzie, viz : in minute doses, at frequent intervals, until free vomiting is induced, and this should be done in all cases, however attenuated or however stout the child may appear. What we desire is to relieve the stomach of its offensive contents, and to render its secretions more natural, to correct and restore the secretions of the kidneys, liver, and other glandular structures, and so influence the capillary system generally, so as to improve the condition of the skin and mucous membrane, and to allay the morbid excitement of the nervous system. This is best done by *tartrate of antimony*, given as above, and it is very important that attention should be paid to the mode of administering this remedy. The following will be found a very convenient form : *Tartrate of antimony, four grains ; syrup, half an ounce ; cinnamon water, three ounces ; distilled water, eight ounces*, as a mixture. For a child under three years of age, two tea-spoonfuls of this medicine should be given every ten minutes, until free vomiting is induced ; above this age, a table-spoonful may be given at the same intervals. The treatment should be repeated daily until the intolerance of light begins to subside, which it will mostly do after the first or second day, although in some of the more obstinate cases four or even six days will elapse before the desired result is obtained. When, however, this takes place, the emetics should be discontinued, and a powder of *calomel* and *rhubarb*, or *mercury* with *chalk*, with compound *scammony* powder, given every night, or every alternate night, until the tongue becomes cleaner, the abdomen softer and flat-

ter, and the alvine secretions more natural; and as this change takes place improvement of the eyes generally accompanies it, if attention be paid to the diet at the same time.

In cases accompanied with extreme attenuation and a cold, clammy state of the skin, it is safer to abstain from *calomel* altogether and substitute the compound *scammony powder* with *taraxacum* and *henbane*; or, if mercury should from any reason be especially indicated, to combine it with the sulphate of quinine, but in no instance should the medicine be pushed with the view of producing ptyalism. After the bowels have been thoroughly cleaned by aperient medicines, Mr. Lawrence advises the employment of tonic medicines, of which he considers bark the best, and quinine the most advantageous form, entirely agreeing with Mr. McKenzie, who says, "In most cases quinine has acted like a charm, abating commonly in a few days the excessive intolerance of light and profuse epiphora, promoting the absorption of pustules, and hastening the cicatrization of ulcers of the cornea."

Dr. Henry Williams considers the sulphate of *berberine* much superior to the sulphate of quinine, not only because it is cheaper, but because it is less likely to excite the circulation or affect the nervous system. The dose is two grains, night and morning.

Where the child is highly nervous and excitable, *henbane*, in tincture or extract, thrice daily, in doses proportionate to the age of the individual, is very useful; but, like the *hydriodate of potasse*, should always be preceded by emetics and alterative medicines. With regard to counter-irritants, they rarely effect any good, but often do mischief, by putting the child in unnecessary torment.

I rarely use them. *Setons* and *blisters* on the temples are, from what I have seen, decidedly injurious.

No class of disease displays more conspicuously and unequivocally the good effects of judicious treatment, than strumous ophthalmia, and on this very ground I would bespeak your attention to its practical study.

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#### SECTION IV.

PURULENT OPHTHALMIA—BLEPHARO-BLENNORRHEA—OPHTHALMO-BLENNORHÉA—OPHTHALMIA NEONATORUM.

This disease,\* which is a very quick and destructive inflammation, makes its attack on children at the third, sixth, eighth, fourteenth day, or even later; sometimes it is observed immediately after birth. The inflammation commences with aversion to light, with slight redness of the conjunctiva palpebrarum, particularly at the inner canthus, and with an itching of the eye-lids, which are covered with glutinous mucus, which hardens and glues the eye-lids together. If they are opened, tears trickle from the eye. At the same time the palpebral conjunctiva is more or less affected with swelling, which is at first soft, somewhat elastic, smooth, and bleeds readily.

The aversion to light and the secretion of mucus are now greater; the mucus acquires a more puriform appearance, becomes thicker and yellowish. The swelling of the palpebral conjunctiva, particularly of the upper eye-lid, as well as the redness, increases, and gives to it the appearance of a finely injected stomach. Also, the epidermis of the upper eye-lid acquires a redness, which, when

\* The ophthalmia purulenta, oculus purulentus of Ware.

the children stretch themselves or cry, verges to a livid color, during which, at the same time, the muscles of the eye push the eye-ball forward. If, after having softened the glued eye-lids with lukewarm water, the eye be now opened, there passes out from between the lids, according to the greater or less severity of the disease, more or less of a whitish, sometimes yellowish, sometimes greenish-yellow, mucus, often mixed with streaks of blood, or, in bad eases, with an ichor, which, resembling the washings of flesh, is often so copious as to cover the whole cheek. The eye-ball is now frequently so covered over with mucus that its external tunics cannot be distinguished. If the eye be cleared of the mucus as well as possible, and if only *blepharo-blennorrhœa* be present, the conjunctiva bulbi will be found very little reddened, the conjunctiva palpebrarum on the other hand, will be found very red, swollen, and loaded with matter. If the inflammation be more violent, and ophthalmic-blennorrhœa be present, then the conjunctiva bulbi is also very red, and so much swollen that it almost entirely covers the cornea, the centre of which can with difficulty be discovered. When, during these examinations of the eye, the infant cries much and endeavors to close the eye, it not unfrequently happens that the upper eyelid, which is now much swollen and fleshy, becomes everted, and a permanent ectropium remains, if the lid be not immediately replaced in the manner to be described hereafter.

Afterwards, the secretion of the puriform mucus ceases by degrees, and a secretion of pure mucus comes on, and at last the whole disease goes off with a flow of tears. If the diseased action has been extensive, but has not penetrated deeply, then at the termination of the disease there

only remains a muddiness of the cornea, which not unfrequently disappears afterwards spontaneously. If, however, the inflammation has been very severe, and the secretion of puriform mucus considerable, then the cornea exfoliates, is converted into a mass of matter which at last bursts in the centre, either suddenly, with severe pain, or slowly without pain, and, the aqueous humor being now discharged, the iris comes to lie in the aperture. Should the ravages proceed further, the iris may even at last fall out of the eye, along with a greater or smaller part of the vitreous humor, and complete colliquation of the latter ensue. The disease does not always stop here, for even in less destructive degrees of this affection, the children often continue afterwards imperfectly nourished, and become atrophic. If several ulcers take place in the now loosened texture of the cornea, if they penetrate deeper, and destroy in different places the innermost lamellæ of the cornea, then the aqueous humor flows out, and the iris penetrates through the holes and exhibits a staphyloma racemosum. If at first the one eye only be affected, the other follows soon afterwards.

Sometimes before the secretion of puriform mucus has increased to any great degree, either in the blepharo, or in the ophthalmic-blennorrhœa, a considerable haemorrhage from the eye occurs, which often returns two or three times, and must be welcomed by the surgeon, for if the blood have the natural appearance, then the secretion of the puriform mucus becomes afterwards less severe and destructive, and the swelling of the affected parts rapidly declines.

*Causes.*—Young, weakly, new-born children, twins, and such as, during birth, have been infected in conse-

quence of the mother having fluor albus, suffer from this inflammation; if the fluor albus was of a venereal nature, the suffering for the most part becomes exceedingly severe, on which point the observations of great men, as *Walther*, *Adam Schmidt*, *Scarpa*, and others, agree. *Mr. France* remarks: "The complaint commonly results from the application of a morbid secretion to the eyes of the child in its transit from the womb. It is not necessary that such secretion should be strictly gonorrhœal. In many cases it is difficult to suppose that the mother can have been the subject of a discharge of that nature. Leucorrhœa, we know, will sometimes excite inflammation, characterized by purulent discharge in the urethra of the male subject, and we therefore may fairly conclude that it is likewise capable of setting on foot purulent inflammation of the conjunctiva."

In like manner, children who, immediately after birth, are exposed to cold, to a current of air, or to a bright light, those scantily nourished, the scrofulous, and such as are exposed to cold during the presence of measles or of scarlatina, are not unfrequently the subjects of this disease.

*Prognosis.*—When the disease has consisted only in a blepharo-blennorrhœa, the prognosis is very favorable, for if the inflammation leave bad effects behind it, they for the most part consist only of a dimness of the cornea, (which can be removed, or may even disappear spontaneously,) or of an eversion of the upper eye-lid, ectropium.

When, however, ophthalmic-blennorrhœa has taken place, and the cornea has become perforated even in a small point, there will very likely remain a partial adhesion of the iris with the cornea, synechia anterior, along with a

more or less extensive cicatrix, which sometimes entirely destroys the sight. If, during the inflammation, either the greatest part or the whole circumference of the iris has become adherent to the cornea, even though the cornea be not perforated, then in the first case a partial, and in the second case a total staphyloma of the cornea takes place. If, however, colliquation of the whole bulb has taken place, then there remains an ill-shaped, small whitish stump in place of the eye-ball, and the eye-lids remain for ever closed.

When we consider the ordinary consequences of neglecting this disease, such as suppuration, ulceration and sloughing of the cornea,—the preludes to permanent damage or entire destruction of vision,—it is satisfactory to think that a perfect remedy is known. Prior to the brilliancy and transparency of the cornea being affected, however violent the inflammation of surrounding and connected structures, the case may, generally speaking, be deemed within the surgeon's own power.

*Treatment.*—If called at the commencement of the disease, which is rarely the case, recourse must always be had to the antiphlogistic remedies, and more or less actively employed, according to the degree of the disease and constitution of the patient. One leech may be applied at the inner canthus over the lachrymal sac; but the disease may often be cured without this, if cold water poultices be immediately used.

Should inflammation be very severe, the tumidity of the palpebræ and conjunctiva excessive, and indications of intense vascular excitement be present, leeches should be applied around the eye, and the blood allowed to flow until the child becomes pale. The topical bleeding thus operates also as a general one.

At the same time remove all causes of the disease, and consider the mother's milk, when good, as the best nourishment for the infant. If disorder in the bowels be present, as retention of the meconium, order a gentle laxative. A mixture of magnesia and rhubarb, with some liquid, is given by most surgeons. *Ber*, and others, recommend, at the commencement of the disease, a strong purge of calomel and jalap. *Saunders*, when he finds the rhubarb and magnesia too weak, gives rhubarb with calomel. I generally prescribe, for this purpose, the gray powder with rhubarb, which usually effects all that is wished in the first instance, viz: to procure free secretion along the intestinal canal, and from the glands associated with it. A slightly laxative condition should be maintained subsequently by castor oil. The whole constitutional treatment is comprised in these simple measures, and the local is scarcely more complex.

We must first enjoin thorough cleansing of the eyes from all purulent secretion by tepid ablution. The sponge, I will here remark, should on no account be used for any other purpose, as the disease is highly contagious. Ablution should be repeated at least every hour, the upper lid being gently detached from the lower, and the warm water suffered to flow between them, to wash away all accumulated discharge. You can scarcely be too precise or earnest in enjoining the observance of these points, for their neglect diminishes, in a serious ratio, the chances of perfect recovery. The use of a syringe with a warm eyewater is advantageous for the purpose of effectually cleansing the surface of the conjunctiva, and may be recommended accordingly, when there is reason to think it will be intelligently and carefully handled.

The eye-water recommended by Saunders, to which some quincee mucilage may be added, is very suitable :

Rx Zinci Sulphat. gr. i.  
Aqua Distill.  $\frac{3}{2}$  i.

The following prescription is very highly spoken of by Schmidt, and I have used it myself with good effect :

Rx Aqua Distill.  $\frac{3}{2}$  x.  
Vitriol Alb.  $\frac{1}{2}$  i.  
Ext. Saturn.  $\frac{3}{2}$  ss.  
Spt. Camphor, 3 ij. M.

With this the eye should be washed from two to four times, daily. When the secretion of mucus is so profuse that the washing out with the solution must be performed every two or three hours, the proportion of the ingredients to the water should be reduced one-half. On the contrary, when the subject is an older child, or an adult, the strength of the solution must be increased. After the eye has been washed or syringed with tepid water, or with the eye-water, it should be carefully dried with a warm cloth and then covered with a compress rubbed over with camphor, or with a little bag of herbs.

In the stage called the suppurative, and when ulcers present themselves on the cornea, the introduction into the eye, once or twice daily, of the Laudan. Liq. Sydenh., is of essential service.

If the flow of puriform mucus diminish under this treatment, and yet much thin whitish mucus continues to be discharged from the eye; or if the conjunctiva has a granular appearance, the salve of mercury, or a simple mixture of ointment with *merc. precip. rub.*, dispensing with all eye-waters during their use, will show their powers, and generally remove the disease within a few days. Slight remaining opacity of the cornea, as already stated, often

disappears of itself, but its removal may be accelerated by the careful use of Janin's salve.

To prevent an ectropium, the eye must be opened as little as possible, and only with the greatest delicacy, and never in children when they are in the act of stretching themselves, or yawning, or crying. If, however, an eversion has already taken place, the palpebra is to be replaced immediately, according to *Schmidt*, in the following manner:—After having smeared the points of the forefinger and thumb of both hands with fresh, unsalted butter, the tarsus is to be laid hold of with these fingers, at the external and internal canthus and stretched slowly a little upward and then quickly downward. When there is much swelling of the conjunctiva, if it be hard and granular, the thumbs must be more firmly pressed upon the middle of the eyelid, when the replacement will succeed. If it do not, the termination of the inflammation must be waited for, and the ectropium treated as a disease consequent upon it.

In regard to general treatment in the blennorrhœal stage of the disease, when the powers of puriform secretion flag, and the object is to excite the powers of reproduction, calamus aromaticus, or bark with opium and ether, must be given. In the ease of children a month old, six grains of extract of bark, mixed with the child's food, have been given every four hours with the greatest advantage.

Purulent ophthalmia in the adult is variable in severity and in termination; yet it presents the same type, whether produced by the direct contact of gonorrhœal matter, or reproduced in a second individual by the ocular discharge of one affected in that manner, or arising alto-

gether independently of any venereal poison. Within my own experience, the disease has generally arisen in the two former ways. But the causes which have operated most extensively in its production, in military practice, have been—exposure to atmospheric vicissitudes, (especially those great alternations between the diurnal and nocturnal temperature which occur in hot climates,) exposure to an atmosphere loaded with moisture, or with sandy particles; confinement in a vitiated atmosphere, as that of an overcrowded barrack or hospital, particularly one thronged with the subjects of this very disease. Most of these circumstances, you will observe, involve the condition of a local irritant, being actually applied to the conjunctiva.

The treatment to be adopted for purulent ophthalmia in the adult, is as follows:—Should there exist evidence of exalted action of the heart and arteries, if the pulse at all approach a full incompressible, bounding character, if the tongue be coated with white fur, the skin hot, etc., blood may be abstracted from the arm in sufficient quantity to diminish the volume and firmness of the pulse, at least down to the level of the natural standard—perhaps a trifle below. Should such symptoms not be evinced, (for constitutional disturbance is exceptional and not habitually present,) and the patient be a person of robust or plethoric habit, blood may still, perhaps, be judiciously drawn, in such quantity as will reduce the pulse slightly below the natural force. The bowels should be cleared at first, and subsequently maintained in a loose state. The diet should be low. Partly to insure the observance of the rule enjoined in this respect, and partly for the sake of its peculiar depressing effect, constant nausea should be

maintained by *ipecacuanha* or *tartarized antimony*; three or four grains of the former, or quarter of a grain of *potassio-tartrate of antimony*, being given every six or four hours, according to the effect produced. One or two grains of calomel must be combined with each dose of the nauseant; it contributes powerfully to check the progress and to promote the reduction of the chemosis, and should be continued till the gums become slightly affected.

These, then, are the constitutional remedies to be relied upon: moderate bleeding, if demanded; low diet, nauseants and mercurials.

The local treatment is equally important. Cupping of the temple must be employed; and should be repeated, if necessary, in moderate quantity; for, as arterial blood constitutes the principal supply of the cupping-glass, an extravagant expenditure by this method is likely to be of still greater eventual injury than the abstraction of a similar quantity from the arm.

From eight to twelve ounces of blood, therefore, I should state as the full extent of a single cupping; and this quantity should not be withdrawn more than twice, or, at the most, three times, and thus often only when the occasion is urgent and the subject vigorous. Leeches may be liberally applied; but no very marked benefit is to be anticipated from their use in this violent disease.

Great care should be observed in procuring, by means of fomentation, and by injections between the palpebrae, if necessary, a free outlet for the purulent secretion; which, however, is generally too abundant to sustain confinement for more than a few minutes. Still, careful and assiduous syringing, or sluicing with warm water or poppy water, is of essential service by preventing entirely the

accumulation of the secretion, which, from its morbid effect upon a *sound* eye, we may well believe to possess peculiarly irritating qualities. The fomenting liquid should be made astringent for injecting between the lids, by the addition of six grains of *alum* to the ounce of fluid. A mild ointment may be advantageously applied between the palpebrae to prevent cohesion; especially at night.

Added to these remedies, and one of the most important of all, is the strong solution of nitrate of silver, made in the proportion of from six to eight grains to the ounce of water. It should be instilled between the lids four or five times in the day.

After the acute stage of the disease has subsided, and the purulent discharge ceased, if both the inflammation and chemosis are diminishing, you may employ a weaker solution of nitrate of silver, or substitute a solution of alum, sulphate of copper, or zinc, for the strong collyrium at first necessary. I have known very marked good effect to result from a collyrium composed of eight minims of the solution of *diacetate of lead*, two drachms of Battley's solution, and six drachms of rose water, even before the complaint could be considered as having fallen into the absolutely chronic state. As the violence of the disease continues to decline, especially if the subject be weakly, he will derive benefit from tonic medicine and tonic diet. The strong solution of nitrate of silver may again be used, and even the caustic, in substance, may be applied for a moment, if an indolent ulcer be creeping on slowly, in order to open the anterior chamber; or, having done so, if the iris has prolapsed, and the ulcer be still indisposed to heal; or if repeated superficial sloughings of the cornea take place. At a yet later period, when cica-

trization is slowly proceeding, mercurial collyria, as the yellow or black wash, may occasionally be employed with great benefit.

As the contagiousness of this disease is certain, the utmost care must be taken to prevent contact of the morbid secretion, either with the patient's sound eye, or with the eyes of any other person. Strict injunction should therefore be given respecting the towels, sponge, basin, etc., used by the subject of the malady.

# DISEASES OF THE EYE.

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## PART SECOND.

### SECTION I.

#### RHEUMATIC OPHTHALMIA—SCLEROTITIS.

SOME authors, and among them Professor Walther, have termed this species of Ophthalmia the arthritica. The epithet rheumatica, given to it by *Beer*, is perhaps the most appropriate, not only because the part in which it is seated is analogous, in texture to that in which rheumatism is commonly found to have its seat, viz : the ligamentous and fibrous parts of the body, but also because it is most generally known to alternate with or succeed to rheumatic affections in other parts of the system ; and it is most prevalent too in those seasons of the year when rheumatism is most frequent.

*Diagnosis.*—The following particulars will serve to distinguish rheumatic from catarrhal ophthalmia.

1. *Seat of the Disease.*—Catarrhal ophthalmia is an affection of the conjunctiva ; the rheumatic has its seat in the albuginea and sclerotica, and frequently extends, in some degree, to the *iris* and even to the *retina*.

2. *Redness.*—The redness in catarrhal ophthalmia is reticular, and the turgid vessels are evidently conjunctival ; in the rheumatic the chief redness is radiated or zonular, and seated under the conjunctiva, or in the deep-seated conjunctival or sclerotic net-work. We never see spots of blood extravasated under the conjunc-

tiva in rheumatic ophthalmia, whereas this is a frequent occurrence in catarrhus oculi.

3. *Nature of the Inflammation.*—Catarrhal ophthalmia is an inflammation of the mucous membrane, and is a blennorrhœal or profluvial disease, attended with an increased morbid secretion of mucus; the rheumatic attacks the fibrous membranes of the organ of vision, and is unattended by any morbid secretion from the surface of the eye.

4. *Pain.*—The pain in catarrhal ophthalmia arises on the surface of the conjunctiva, and is compared to the sensation of roughness or to the feeling excited by sand or broken glass under the eye-lids; it does not extend to the head, and is felt most in the morning, or when the eyes are moved. In rheumatic ophthalmia the pain of the eyes is pulsative and deep-seated; the chief pain is not, however, so much in the eye-ball, as round the orbit, under the eye-brow, and in the temple, cheek, and side of the nose, and is most severe from sunset to sunrise.

*Dr. Mackenzie* justly goes on to say: “ Were I asked what is meant by rheumatic ophthalmia? I should answer to the following effect:

“ 1. By rheumatic ophthalmia I mean simply inflammation of the fibrous membrane of the eye, (the scleroteca,) and of the adjacent parts of similar structure, excited by exposure to cold.

“ 2. I do not regard this ophthalmia as an inflammation differing in kind from common inflammation, in consequence of the existence of what has been called the rheumatic habit or diathesis. The train of symptoms seems to depend, not on the constitution of the person, but on the structure and functions of the part affected.

"3. Rheumatic subjects are by no means exempt from this ophthalmia; yet it frequently occurs in individuals who have never suffered from rheumatism in any other part of the body.

"4. When rheumatism quits a joint and attacks the heart, we say it is a metastasis; but such a translation of rheumatic inflammation to the eye, I have never myself observed. In all the cases of rheumatic scleritis which I have witnessed, the disease was primary, whether in rheumatic or non-rheumatic subjects; never metastatic.

"5. I have adopted the term rheumatic ophthalmia; but, perhaps, scleritis idiopathica would be a truer appellation. It must be confessed, however, that this inflammation of the eye resembles rheumatism in its exciting causes, accompanying pain, exacerbations and cure. It has not been generally recognized as rheumatic, probably because it attacks structures which are covered only by a thin semitransparent membrane, and therefore exposed to direct examination; while the other seats of rheumatism are hid from our view by the whole thickness of the integuments, and are the subjects, therefore, more of conjecture than of actual observation."

*Degree of frequency.*—Pure rheumatic ophthalmia is comparatively a rare disease. For one case of pure rheumatic, we meet with, perhaps, ten cases of catarrhal ophthalmia, and six of that mixed kind called catarrho-rheumatic, in which both the conjunctiva and sclerotica are affected, and the symptoms of the two former ophthalmiae are combined. We seldom see both eyes affected with rheumatic ophthalmia at once. When both are attacked, the one is always much more severely inflamed than the other.

*Local symptoms.*—1. The fasciculi of vessels advance in radii towards the edge and sometimes even a little over the edge of the cornea. They are of a bright red color, and surround the cornea pretty equally on all sides. Although probably the same radiating vessels which are seen in iritis, they appear larger and more turgid than in that disease, and rise more from the surface of the sclerotica. In iritis these vessels are filled only sympathetically ; here they are affected idiopathically. The conjunctivitis which attends this ophthalmia is slight, and never such as to mask the radiated inflammation of the sclerotica.

2. There is in general no tendency to chemosis in pure rheumatic ophthalmia, nor do the eyelids take part in the disease, so as to glue the eye up during sleep.

3. Dimness of vision uniformly attends this ophthalmia, depending on an accompanying haziness of the cornea and pupil, attended by a slight contraction of the latter and sluggishness in the movements of the iris. If only one eye is affected, which, at least for some time, is generally the case, the pupil of that eye is seen at once to be smaller than that of the sound eye. The iris becomes slightly discolored ; it becomes greenish, for instance, if naturally blue ; and the attending iritis may proceed even to effusion of coagulable lymph within the pupil. It must be understood, however, that a severe degree of iritis rarely attends rheumatic ophthalmia.

4. Excepting the haziness of the cornea and pupil, which may be attributed to slight effusion, I have never witnessed any other of the secondary phenomena of inflammation in idiopathic scleritis. I have never known the disease to terminate in any form of suppuration or of ulceration, both of which are very common in catarrho-rheumatic ophthalmia.

5. The access of light does not in general prove very distressing to the patient. The affected eye feels dry and hot in the early period of the disease ; but after a time, especially when the symptoms are somewhat abated by blood-letting, there is considerable epiphora.

6. The pain which attends rheumatic ophthalmia at its commencement is of a stinging kind, and extends from the eye-ball to the orbit and neighboring parts of the head. These parts feel hot to the patient, and even to the hand of a person touching them. The pain is strikingly augmented by warmth ; but relieved by perspiration. It often affects the forehead, the cheek-bone and the teeth, extending sometimes even to the lower jaw. Occasionally, it is confined entirely to one half of the head. In some instances, it is severe on the side of the nose, or within its cavities, or in the ear. But, above all, the superciliary ridge is its chief seat, and next to it the temple and the cheek. Not unfrequently the pain has the acute pulsatory character of phlegmon, especially when felt chiefly in the eye-ball ; in other cases, and particularly around the orbit, it consists rather in an agonizing feeling, which distresses and wearis the patient of the person affected. It never ceases entirely, so long as the disease continues ; but it varies much in degree, coming on with severity about four, six or eight o'clock in the evening, continuing during the night, becoming most severe about midnight, and abating towards five or six in the morning ; till then, totally preventing sleep and occasioning great distress. The patient never fails, in the history he gives of his case, to insist on the nocturnal pain, and with his finger to point out its supra-ocular or circum-orbital seat. It affects the forehead, temple, cheek, and

side of the nose, much more than the eye-ball. It is reasonable to conclude, in this disease, that the periosteum in and round the orbit, and the fascia of the temporal muscle, structures similar in nature to the sclerotica, may also be affected with rheumatism. The chief seat of the pain, however, appears to be one or more of the six branches of the fifth nerve, which, radiating from the orbit, are distributed to the face, and therefore we may fairly suppose a considerable portion of the pain to arise from the sympathy which these nerves have with those distributed to the interior of the eye-ball, and which lie imbedded on the inside of the sclerotica.

*Constitutional symptoms.*—A considerable degree of symptomatic fever attends this disease, increasing with the nocturnal paroxysms of pain. The pulse becomes frequent and sometimes strong, full and hard. The tongue is white and furred, with a bad taste in the mouth; there is more or less nausea, and the skin is hot and dry. The digestive organs are deranged, the appetite impaired, the bowels generally confined, and the excretions morbid.

The progress and severity of the disease vary much in different cases. In some the attack is slight, and soon goes off without permanently injuring the organ. At other times it is extremely severe, and if not understood and properly treated, may soon destroy vision. Not unfrequently the disease passes into a chronic state, without being very severe.

*Exciting causes.*—Rheumatic ophthalmia may be distinctly traced, in most instances, to exposure of the eye to a continued stream of cold air while the head and face were in a state of perspiration. The patient, in the his-

tory which he gives of his case, commonly mentions some particular exposure of this sort, soon after which the redness and rheumatic pain commenced; for example, sleeping with the head exposed to the air entering through a chink in the wall, or by a broken pane of glass; travelling during the night in a carriage with one side of the head close to a broken window; suddenly issuing from a crowded room into the cold open air; exposure to the current of air which flows from the stage into the body of a theatre; carrying wet clothes on the head when overheated, and the like.

*Prognosis.*—When the disease is taken in hand in time the prognosis is favorable. Allowed to proceed in its course, the pupil may close, or the anterior crystalline capsule be left opaque.

*Treatment.*—1. *Blood-letting.* In all cases of rheumatic ophthalmia, it is necessary to take away blood from the arm, and in general to follow this up by the application of leeches to the forehead and temple. The blood drawn is generally very buffy. The buffy coat is not dark yellow, as in hepatitis or in syphilis; but whitish, as in pleuritis. The first night, after taking from 15 to 20 ounces from the arm, the patient is often so much relieved as to get some sleep, even though no other remedy be employed. Next day, I am in the habit of applying a dozen leeches around the eye; but if the pulse be still strong and full, and the circumorbital pain not relieved, I first repeat the venesection, and I have had cases under my care which required the bleeding to be repeated five or six times, before the severe circumorbital pain and other acute symptoms subsided in any considerable degree.

2. *Calomel and opium.*—I have never failed to find

this combination highly useful in checking the circumorbital pain, and dissipating the other symptoms. A pill, containing four grains of ealomel with one grain of opium, is to be administered every evening till the gums begin to be affected, when the ealomel may be omitted, and ten grains of Dover's powder substituted for the opium. In some cases, smaller but more frequent doses of ealomel and opium may be proper, such as two grains of ealomel with half a grain of opium, three a day.

3. *Opiate frictions.*—The patient experiences great relief from carefully rubbing the forehead and temples with warm laudanum, or with extract of belladonna infused in laudanum. This ought to be done about an hour before the nocturnal paroxysm is expected, which it will greatly assuage, and sometimes entirely prevent. In chronic cases equal parts of laudanum and tincture of cantharides form a useful liniment.

4. *Blisters* behind the ear, and on the temple, but, above all, a large blister applied to the nape of the neck, will be found useful.

5. *Belladonna.* During the whole course of rheumatic ophthalmia, the pupil of the affected eye ought to be kept under the influence of belladonna, either by painting the moistened extract upon the eye-brow and eye-lids, morning and evening, but especially at bed time; or by infusing one drachm of the extract in each ounce of the laudanum which is used for rubbing the head.

6. *Purgatives.*—An active dose of laxative medicine should be administered at the commencement of the treatment. Afterwards a laxative elyster every morning, or a small dose of Epsom salt may be employed, to obviate the constipating effects of the opium. Very active

purgatives are now improper, as they would carry off the calomel and opium, and thereby prevent their good effects.

7. *Sudorifics*.—The warm pediluvium at bed-time, with diluent drinks towards evening, operating along with the opium, will in general excite a sufficient degree of diaphoresis. *Mr. Wardrop* recommends antimonial powder, and *Beer* employed guaiac for exciting the skin in this disease.

8. *Tonics*.—Small doses of sulphate of quinia or of the mineral acids will be found advantageous in the chronic stage of the disease and during convalescence. In old cases, that have been improperly treated, Fowler's solution sometimes gives great relief, in doses of from eight to twelve drops three times a day.

9. *Vinum Opii*.—Applications to the eye itself have but little effect upon the disease. Those which are so useful in other ophthalmiae are often hurtful in the rheumatic. The lunar caustic solution, for instance, which may be regarded as a specific in catarrhal ophthalmia, is in the present disease decidedly injurious. When, however, all the febrile and painful symptoms are gone, and but little more than lingering redness, with weakness of the eye, remains, the vinum opii, dropped upon the eye in a diluted state, twice or thrice, or, undiluted, once daily, will be found beneficial.

The first, second, third and fifth of these remedies are to be had recourse to as the most reliable. I have never found them fail in any acute case, however severe; nor have I ever known any permanent sequelæ to result from the plan of treatment here laid down, when pursued with the necessary vigor.

## SECTION II.

## OF THE DISEASES OF THE CORNEA.

## PURE INFLAMMATION OF THE CORNEA—CORNEITIS.

AT first the cornea is somewhat dim, and has a dull, muddy appearance; by degrees it acquires a reddish glitter, and, when the inflammation has progressed, the vessels in it become visible; and considerable pain of the eye is commonly felt. When the inflammation has commenced from the sclerotica, the vessels in the cornea seldom appear distinctly; they are generally so fine that they can scarcely be seen with the bare eye; but if the inflammation has advanced from the conjunctiva scleroticae to the conjunctiva cornea, then the vessels are usually much larger and run almost straight; this latter kind of inflammation belongs to conjunctivitis, under which head it has been already treated of. In severe cases the iris becomes inflamed; but this circumstance may escape detection, from the difficulty of seeing the iris through the hazy or opaque cornea. Pain in the globe and orbit and intolerance of light generally accompany the other symptoms.

*Treatment.*—The treatment of cornicitis, when neither ulceration nor abscess exists, should consist, first, in depletion; secondly, in making use of counter-irritation, and producing impression upon the system by mercurials. General depletion is required in the acute form; local depletion with counter-irritation in the chronic; and as constitutional disturbance is not always present, we look principally to the local symptoms. In young persons under the age of puberty, cupping or leeching, with the

addition of brisk purgatives, will usually be sufficient ; in adults of full habit, however, abstraction of blood from the arm, as well as local bleeding, is necessary.

As the disorder begins to yield, vascularity in the conjunctiva scleroticae lessens ; the cornea becomes less opaque, and intolerance of light diminishes. After this, occasional application of leeches to the temple, and continued counter-irritants,—as blister, seton, or issue,—may be required. Stimulants in diet must be avoided, and the healthy condition of the digestive organs be attended to ; and in these, as in most cases of local disease, you will find it necessary to insure daily evacuation of the bowels by a saline purgative. It sometimes happens, however, when the chronic state has supervened, and all indications of active vascular excitement have disappeared, that loss of transparency in the cornea remains ; a haziness being still observable, usually thickest on the anterior part of the tunic, and arising from interstitial effusion and partial organization of adhesive matter. This effusion, called nebula, is principally between the conjunctiva and the cornea, or between the anterior layers of the latter membrane.

Corneal nebula differs from the temporary opacity produced by active inflammation, in being the result of gradual and slow effusion, and not being altogether created by an alteration in the circulating fluids of the capillary system. We have analogy for this in morbid affections of the peritoneum, pleura and arachnoid. The degree of vascularity in the conjunctiva and sclerotica, and the presence or absence of disease in adjacent parts, must guide your treatment. You will frequently succeed in removing true nebula of the cornea, if recently formed, by mercur-

rials. For nebula of long standing no remedies are known. It is only, therefore, in recent cases, before organization of the new matter becomes complete, that we affect the system by mercury, in order to remove an opaque spot from the axis of vision. In giving mercury it is not necessary to salivate; the appearance of a red line on the gums will be sufficient proof that your medicines are doing all that is required; and if after a week or two no impression has been made upon the opaque spot, you will rarely succeed in your object. After this time, therefore, either suspend or continue the use of mercurials according to the state of your patient's constitution. If, however, the transparency begins to reappear, you should persevere, of course, until the cure is perfect.

Whilst thus endeavoring to induce a restorative action in the part, by the operation of mercury upon the system, you will find great assistance from the use of local stimulants or astringents. By these you may still further excite the absorbent and capillary systems; and the removal of the nebulous opacity will consequently be considerably hastened. There are many formulæ of astringent collyria advantageous in these cases, but, I have always found the mercurial most useful. The following are those I generally employ:

R Hyd. Chlorid. grs. v.      Rx Hyd. Bichlorid. gr. ij.  
Liq. Calcis.      ʒ i. M.      Liq. Calcis.      ʒ i. M.

By these constitutional and local means we frequently succeed in removing recent opacity of the cornea. You must be careful, however, in distinguishing opacity of active inflammation from the chronic nebula I have described; for stimulating collyria are useful in the one case, but in-

jurious in the other. Vascularity of the sclerotica, pain, and intolerance of light, are symptoms which forbid the use of stimulants, and indicate the necessity of depletion.

Such are the common symptoms, and such the treatment of simple corneitis. Sometimes, indeed, the consequences of the disease are different, and, instead of opacity, suppurative and ulcerative inflammation follows, and an ulcer forms on the surface of the cornea.

*Mr. John F. France*, in his note to *Mr. Morgan's Lectures*, (from which I have extracted some part of this section,) remarks : The prognosis with respect to opacities of the cornea must be drawn from an estimate of the age of the patient, the density of the opacity and its duration ; the younger the individual, the less dense the nebula and the shorter the period of its duration, the better too being the prospect of its entire removal. In young children the opaque cicatrix following actual ulceration is susceptible of perfect cure. It is not often, however, that resort to mercury, so as to affect the system, is called for in the treatment of these cases. After subsidence of inflammation, local measures are more to be depended upon ; and, in addition to the applications mentioned in the text, there are two which deserve especial notice. Calomel, inflated as powder upon the cornea, is in certain cases of nebula, in which vascular excitement has quite passed away, of excellent service ; and the same credit is due to *iodide of potassium*, dissolved in water in the proportion of six or eight grains to the ounce. These remedies, together with those previously specified, are worthy of the fullest reliance. *Dr. Weller* says—“ There is almost no disease for which so many external means have been recommended, as for specks of the cornea. The reason probably is not

only the frequent obstinacy and incurability of the disease, but also the want of perseverance of the patient and surgeon in the necessary plan of cure; a person proceeds from one medicine to another, because he has lost confidence in the first, by means of which the disease does not disappear sufficiently rapidly. However, a frequent change of the applications, and a gradual increase of strength, are very favorable, and necessary to the cure."

I shall endeavor to mention the medicines of decided efficacy. They may all be properly divided into two classes, of which the first contains the emollients and resolvents, the second the stimulants. This division is important; for as in recent, soft specks, stimulants are indicated from the commencement, and as in hard, old, very opaque opacities and specks, the use of resolvents is first required, and then the application of stimulants, so there is a general division of specks into these two classes, which has great influence in practice.

We may conclude that a speck is of soft consistence when it is dark-gray, dull, not glistening, but shaded at its edge, and furnished with fine blood-vessels running towards it. If these characters be not present, the specks are of harder consistence, and must be first treated with emollient and afterwards with stimulant medicines.

Dried abscesses and chalk-like specks which, after a change of resolvent medicines, do not alter their appearance and consistence, must be searified superficially, and then the use of the same means must be resumed.

Among the emollient, resolvent medicines the following may be enumerated: the *axungia viperina*, *oleum ororum*, *medull. ossium recens.*, *liquamen hepatis mustellæ fluvialis*, *kali carbonicum*.

Rx Kali. Carbon. gr. ij.  
Aqua Distill.  $\frac{3}{2}$  i. M. solven.

Some drops to be poured into the eye five or six times daily.

Among the class of stimulant applications may be enumerated, *raneid oils*, *sal. volat.*, *corn. cervi*, *alumen*, *zincum sulphuricum*, *laudan. liquid. Syd.*, *mercurius*, particularly *merc. precip. ruber*, mixed into a salve, *potassa fusa. lap. infernal*, (one or two grains to half an ounce of water, the same proportion of potassa fusa is proper.)

So far with regard to simple means. From among the most particular and most effectual compounds which have been celebrated by ancient and modern surgeons, I shall select only the following :

Rx Sal. Volat. C. C. gr. v.  
Fell. Taur. Inspiss,  $\frac{3}{2}$  i.  
Extr. Chelidon,  $\frac{3}{2}$  ij. M.

To be streaked on the eye by means of a pencil.

Rx Sal. Corn. Cervi, grs. xii.  
Fel. Taur.  $\frac{3}{2}$  i.  
Mell. Despum,  $\frac{3}{2}$  iiij. M.

The speeks to be streaked over with it several times daily.—*Richter.*

Rx Liq. Ammon. Caust. gtt. x.  
Olei Nuc Jugland,  $\frac{3}{2}$  ss. M.

To be streaked on the speek with a pencil, the quantity of the liq. ammon. to be increased in proportion to the diminution of the irritability of the eye.—*Graefc.*

Rx Aqua Rosarum,  $\frac{3}{2}$  ij.  
Sacchar. Alb.  
Boracis Venet.,  $\bar{a}$   $\frac{3}{2}$  ss.  
Ext. Aloes Aquos.  
Ext. Opii,  $\bar{a}$  gr. vi. M. extract.

Rx Mercur. sub. eorr., gr. i.  
 Opii, Colat., gr. viii. solve in.  
 Aq. Ros., 3 ij.

Rx Liquam Hcp. Must. Flui., 3 i.  
 Butyr. Recent Insuls, 3 ss.  
 Merc. Prec. Rub., gr. xv.  
 Vitriol Alb., gr. vi. M. exact. ft. ung.

Rx Butyr. Vaccini Insuls, 3 ij.  
 Merc. Precip. Rub., gr. xv.  
 Tutiae Präp., gr. vi. M. exact. ft. ung.

A small quantity to be introduced into the eye once daily, by means of a pencil.—*Beer.*

When a speck is nourished by blood-vessels, which in such cases often run in bundles, it will be proper to elevate the vessels gently, and cut out a portion of them; the communication of the blood-vessels with the speck will be thus intercepted, and the speck, now robbed of its support, will more readily yield to the usual means.

### SECTION III.

#### ULCERS OF THE CORNEA.

ULCERATION of the cornea is commonly produced either by inflammation, a small pustule, or an abscess bursting externally. It is also produced by wounds or sloughing of the cornea.

An ulcer of the cornea propria appears to be slightly elevated around its circumference, and depressed a little at its centre, the ulcerated part having formed the cyst of an abscess, or been denuded of its conjunctival covering. The ulcerated part discharges a watery fluid, and it very often retains the usual transparency of the cornea. But

when the ulcer is healing, an opaque or ash-colored line makes its appearance around its circumference, which marks the size of the ulcer, and shows the healing process to be going on by adhesive inflammation; and when the ulcer has healed, the opacity, which it generally leaves, is never so large as the part marked by this opaque line. The size of ulcers upon the cornea varies from that of the depression made by the point of a pin to one-third of the size of the cornea. Their depth also varies. They are commonly not deeper than the conjunctival covering; sometimes, however, they penetrate through the whole thickness of the cornea propria, and lay bare the membrane of the aqueous humor, which sometimes gives way and bursts. This allows the aqueous humor, a portion of the iris, and sometimes, when the ulcer is large, a part or even the whole of the vitreous humor, to escape. When this last mentioned circumstance takes place, it causes inevitable blindness by the collapsing of the eye.

Ulcers of the cornea are commonly attended with chronic inflammation and irritability of the eye. These, as well as the ulceration, are generally the consequences of acute inflammation. The chronic inflammation and irritability continue till the ulcer is healed, the cicatrizing process being carried on by inflammatory action.

*Treatment.*—Ulceration of the cornea, like that of other parts of the body, often heals spontaneously. In many cases, however, the healing process becomes tardy, and requires to be promoted by remedies. After acute inflammation has abated, local applications may be employed to promote the healing of ulceration of the cornea. The most effectual of these is the *nitrate of silver*. This

application allays the inflammation and irritability of the eye, and promotes the healing of the ulcer. The nitrate of silver may be applied to an ulcer of the cornea, either in the solid form, sharpened to a point, or by solution of it. A strong solution, consisting of one drachm to an ounce of water, may be applied by means of a hair pencil; and this application may be repeated in a day or two if necessary; or a weak solution, containing one or two grains to an ounce of water, may be injected between the eye-lids twice a day. One or two applications of the nitrate of silver will, in many cases, reduce the ulcer to a healing state, and no further repetition of it will be necessary. In applying nitrate of silver to an ulcer of the cornea, the formation of an eschar upon it is carefully to be guarded against; for the repetition of this would soon make an opening completely through the cornea, by which the loss of the eye would be almost certain. Other stimulating astringent and escharotic substances must occasionally be employed in different forms and used alternately for the purpose of healing ulcers of the cornea.

#### STAPHYLOMA OF THE CORNEA.

Staphyloma is an abnormal opaque projection of the cornea, usually produced by ulceration, and always attended during its formation with considerable inflammatory action. Staphyloma is of two kinds: one form is produced by a morbid condition of the cornea only; while in the other, the iris also enters into the composition of the tumor. They arise in the following way: The cornea, having become thinned and weakened by ulceration, yields to the pressure of the contents of the globe and bulges forward; adhesive inflammation takes place in the

part, and fibrin is poured out and organized. By the deposition and organization of this new matter, the ulcerated tunic is strengthened and partially repaired, and increase of the tumor prevented.

Now, when an extensive ulcer penetrates completely through the cornea, and the aqueous humor escapes, the iris prolapses, and lying in contact with the posterior surface of the cornea, is kept in that situation by the contents of the globe pressing from behind. Meanwhile the iris, becoming inflamed, throws out a layer of lymph on its anterior surface ; and so adhesive inflammation of the cornea on one hand, and of the iris on the other, with the circumstance of their being placed in close opposition, occasion permanent union by adhesion between the two. The iris, being thus glued to the cornea, is pushed forward together with that coat, and consequently forms a part of the staphylomatous tumor.

If, however, there is no ulcerated aperture through the cornea, the latter alone bulges forward, and the iris retains, to a certain extent, its natural position.

These, then, are the two kinds of staphyloma—the one being composed solely of a morbid dilatation and opacity of cornea ; the other including, besides these conditions, a bulging and adherent iris. The former is of a pearly white color, the latter of a gray or bluish hue.

The particular causes of this disease are variolous and morbillious ophthalmiae, scrofulous ophthalmo-blennorrhœa, ophthalmia neonatorum, wounds of the eye, &c.

The prognosis varies ; for if, in a case of partial staphyloma of the cornea, the vision still exist, the staphyloma may indeed be cured, and the remaining sight preserved, but it cannot be augmented. If the partial staphyloma

has entirely destroyed the vision, the projecting growth may be removed, (provided no varieosity be observable in the eye,) but the vision never more returns. If, however, the eye be varicose in any considerable degree, the application of the escharoties, which were formerly in use, would completely destroy it. In cases of total staphyloma, not only can the smallest degree of sight never be restored, but often, when considerable exsophthalmia is combined with it, even the life of the patient is in danger, because, under such circumstances, slight contusions not unfrequently give rise to hideous exophthalmæ, for which reason every large total staphyloma must be removed as speedily as possible by an experienced oculist, which operation will be described in another part of this treatise.

The prognosis is in general more favorable than in conical-shaped staphyloma. Staphyloma may occur in one eye only, or in both at the same time. Its progress varies; sometimes it grows to a certain size, and then remains stationary; sometimes it gradually grows till it bursts; it often changes into a sarcomatous mass, which increases in bulk and renders necessary the extirpation of the whole eye.

To remove a partial staphyloma of the cornea, astringents, applied locally, were formerly in use; nitrous acid, sulphuric acid, and lapis infernalis, were also recommended, and the butyrum antimonii was regarded as a specific. Beer has spoken, and justly too, in favor of the latter medicine. When, therefore, the deformed eye is not too irritable, and there is no varieosity of the eye, the apex of the partial staphyloma may be touched with a fine hair pencil, lightly dipped in butyrum antimonii, but let

the eye-lid be kept open until a white, dead crust forms, which is then to be washed over by means of a larger pencil dipped in water or milk, so that none of the corrosive applications may adhere and produce morbid symptoms. The use of this caustic should not be repeated until the inflammation excited by the first application has completely disappeared and the mortified crust fallen off. Strong eye-salves, and in general medicines which extend over the eye, must be entirely avoided. Newly formed staphyloma, whilst yet soft, can be removed or diminished by bathing the diseased eye with iced-water.

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## SECTION IV.

### OF THE DISEASES OF THE IRIS—IRITIS.

THE subject of the present section is a disease common to all ages, the middle period of life being, from causes we shall presently see, the most liable to its attacks. There is no difficulty in accounting for the proneness of the iris to inflammation; its high vascular and nervous endowment, its continual change of condition with every variation of light and distance of the objects of vision, its juxtaposition and connection with other irritable parts, all furnish a ready explanation of the fact. But certain adventitious constitutional conditions greatly heighten the natural susceptibility of the membrane; they arise particularly from syphilitic contamination, or excessive, mercurial treatment, and from rheumatic or gouty diathesis. When not superinduced by disease of similar nature in a neighboring structure, iritis is generally caused di-

rectly by exposure to damp and sudden changes of temperature, or mechanical violence. Wounds of the eye may excite it, whether they inflict actual injury upon the membrane, as in accidents and operations for artificial pupil, or merely disturb and irritate it, as in extraction of cataract and of foreign bodies; or occasional pressure, as from fragments of a divided lens. Iritis is likewise occasionally produced by sympathetic influence.

Much difference of opinion has existed with respect to the varieties of the complaint, and the degree of importance which should be conceded to the distinction between them. It is, however, a fact, disputed I conceive by none possessing a practical acquaintance with the subject, that—taking any given case of pure iritis (produced, for example, by a wound of the membrane) as an illustration of the simplest normal phenomena of the disease—we should have therein a specimen altogether devoid of certain characters occurring in constitutions tainted with syphilis, or prone to rheumatism. Again, few persons at all conversant with ophthalmic surgery would be unable to point out which of two given specimens was influenced by rheumatism and which by syphilis; and no practitioner with adequate experience, though he might deny the separate existence of a syphilitic form, could assert the identity of character in all cases of iritis.

Now if these points be granted, we have sufficient reason for the distinction. The question, if these premises be admitted, is reduced to a mere verbal one—one of degree. It is just this: whether the difference between two classes of cases which enables the observer generally to diagnosticate the principal cause of the complaint in each, and to foretell, with a considerable degree of accuracy, cer-

tain corresponding variations in their respective progress and results, and to lay down a system of treatment beneficial in the one class, but inapplicable in the other—whether dissimilarity such as this constitutes adequate ground for regarding the several groups of morbid phenomena as distinct from one another or not. Cases indeed occur in which the distinguishing characters are obscured or shrouded from observation. But this does not invalidate the distinction where it is practicable. We do not ignore simple synovitis because we find similar inflammation of the synovial membranes a phenomenon of rheumatism. We do not regard syphilitic ulceration as less entitled to specific consideration and treatment because the affected parts may be the seats of ulceration of other kinds. Nor, to adopt an illustration peculiarly apposite, do we confound pleurisy and pneumonia because the two diseases often co-exist.

So, simple, arthritic and syphilitic iritis are in a multitude of cases broadly and palpably distinct; in some the lines of demarcation are obscured. For, of course, the syphilitic disease may occur in a person previously rheumatic, and consequently may present an ambiguous aspect; and in similar manner iritis of mingled character may arise where syphilitic taint, is almost eradicated, but still causes greater liability than usual to rheumatic affections. In a word, the three forms of iritis in numerous instances arise, progress and terminate as distinct varieties; but, like other complaints, they admit of complication, and a veil is then thrown over their characteristic features.

The circumstances, perhaps, under which pure idiopathic iritis most frequently occurs, consist in the long continuance of severe conjunctival and corneal inflamma-

tion, accompanied by active injection of the sclerotica, in persons of serofulous diathesis and feeble constitutional power. In some instances of this kind the existence of iritis becomes known only when, on the subsidence of the superficial inflammation, and the clearing away of the nebulous opacity of the cornea, the iris is restored to view and we perceive the adventitious adhesions it has formed. Previous to the cornea having sufficiently cleared, we can, in cases of this kind, only suspect that the iris has become involved, when pain in the temple or deep in the globe of the eye is complained of, and the impairment of vision is greater than the haziness of the cornea could explain.

In the majority of instances pure iritis is traumatic, being occasioned by accidental injury or operations, as already noticed. For convenience' sake, the symptoms may be regarded as two-fold, subjective and objective; the former class including those of which the patient is himself alone aware; the latter, those which are apparent to the surgeon. The objective symptoms are:—Injection of the conjunctiva and sclerotica, which increases from a slightly blood-shot appearance until the morbid vascularity has reached a considerable degree of intensity, the conjunctival net-work of red vessels sometimes hiding those of the sclerotica. When not thus shut out from observation, the latter create a blush of delicate pink, pervading the anterior portion of the globe and forming a zone around the cornea. The zone is generally two or three lines in breadth, and is gradually shaded off and lost at that distance from the corneal margin. The combined conjunctival and sclerotic vascularity is very striking, and materially differs in aspect from the appearances resulting from catarrhal or other merely superficial ophthalmia.

Hence the practised observer is at once directed to the structures behind the cornea as the seat of the mischief, and the inflammation of the external tunics is known to be subordinate. The cornea may be as clear as in the healthy eye; but when the conjunctiva sympathizes to a great extent, its surface will usually be found devoid of the normal lustre. The affected iris, contrasted with that of the other eye, appears dull and discolored, the precise hue varying considerably in correspondence with the color natural to the part; its mobility is impaired, its pupillary margin less sharply defined than before, the aperture more contracted, and the area of the pupil dim.

The change of color which the organ undergoes is one of the most striking characteristic of iritis. A light-colored iris assumes, under inflammation, a yellowish or greenish tint; occasionally it is distinctly yellow, and if the eye be blue, a bright green is sometimes seen. Generally, however, the tint, whether yellow or green, is of a dull and muddy cast, and darker than in the sound state. In case of the iris being naturally dark-colored it is less altered under inflammation, presenting merely a reddish tinge. Together with these changes of color, there is a complete loss of its natural brilliancy; it becomes dull and dark, and the beautiful fibrous arrangement which characterizes it in the healthy state, is either confused or entirely lost. These changes, which are rendered particularly obvious by the contrast between the inflamed and the sound eye, commence in the pupillary margin. In an early period, the very edge of the pupil alone may be affected; the internal circle then becomes altered in color and thickened, and afterwards the change spreads gradually to the external or ciliary edge of the

iris. This alteration of color is produced by effusion into the texture of the organ, and the particular tint is such as would arise from blending with the natural color of the iris that of the lymph, which is yellowish or brownish.

Should the quantity of lymph be abundant, the pupil may be blocked up, and the passage of light to the retina totally stopped ; if it be scanty, the confines of the aperture will merely be glued to the capsule of the crystalline lens.

As respects the subjective symptoms, the patient will probably, in reply to questions, complain of pain about the temple and forehead, or in the globe of the eye, and of tenderness of the latter upon pressure. He generally manifests a morbid sensitiveness to light, and always experiences impairment or loss of vision. These symptoms vary considerably in degree.

The impairment of vision is produced partly by haziness of the lining membranes of the aqueous chamber. In severe cases which involve the choroid, it is also, and in a greater degree, attributable to the vascular distention of the latter tunie, the pressure of which interferes with the functions of the retina. Intolerance is generally experienced ; exposure to the light often produces lachrymation and suffering at first, but after a continuance of a minute or two the patient becomes reconciled to it. Thus when an attempt is made to raise the upper lid for the purpose of inspection, the eye will probably become suffused with tears, and the patient instinctively shrink, though a little resolution will enable him to bear examination without inconvenience.

The distinction of cases of iritis and slight corneitis is of great importance, and demands considerable attention.

I say slight corneitis, for in its aggravated form the opacity and vascular excitement, conspicuous in the superficial structure, almost excludes a possibility of mistake. But slight corneitis, like iritis, may be accompanied by conjunctival vascularity; may cause the zonular vessels of the sclerotic to become abnormally injected, and habitually creates such a delicate haziness of the cornea as often to be mistaken for dullness of the iris. And here I must mention one very fruitful cause of erroneous diagnosis in cases of this kind, and that is, inadequate examination, being satisfied with too cursory an inspection of the inflamed organ, or inspection without sufficient light. Unnecessarily great or protracted exposure can scarcely be too carefully avoided; but where doubt exists, it is absolutely necessary to examine the eye steadily and with sufficient though moderate light. Perhaps it is as much from a neglect of this precaution as from ignorance of the different characters of the two diseases, that mistakes often arise respecting them. Owing to such mistakes, I have known calomel and opium inflicted three times daily, and followed up with the cupping-glass, for the cure of supposed iritis, which, being in reality only slight inflammation of the cornea, readily yielded to the application of a leech or two, an opiate collyrium, and a mild purgative.

Under proper examination, the two cases are found to differ as to the seat of the morbid change which imparts apparent dullness to the iris. In iritis, from every point of view, the loss of brilliancy seems deep-seated, evident and uniform. In inflammation of the cornea the haze is perceived to be more superficial and to arise from change in that structure. Moreover, if (as generally happens)

some portion retains its healthy transparency, through this portion the iris may be discovered lustrous and bright as ever. The question, however, arises, where there is no doubt of the existence of corneitis, whether the iris is also inflamed or not. There is perhaps complete haziness of the cornea, and the iris is seen as through a veil, no part of the membrane being clearly perceptible. Yet we can perceive without difficulty, in numerous cases of this kind, that the pupil dilates and contracts briskly, and we may then with confidence determine that the iris is not inflamed. When opacity of the cornea is greater, and neither the mobility of the iris nor its brilliancy can be judged of, we must be content with presumptive evidence. Most cases of this kind are really instances of simple inflammation of the cornea, for which the deep-seated parts have little disposition. We should, therefore, if any suspicion of the co-existence of iritis has been suggested, (after carefully considering the history of the case,) inquire concerning pain at the temple, forehead, and in the globe of the eye, or tenderness of the globe, and ascertain whether the imperfection of vision be merely such as might be expected from corneal opacity, or whether it be considerably greater than could fairly be ascribed to that cause.

*Diagnosis.*—Iritis being proved by the symptoms previously enumerated, the disease is known to be of the arthritic variety by the dull brick-dust hue of the reddened eye; the white line surrounding the cornea, wholly or in part; the diffused character of the inflammatory haziness of the anterior chamber; the early production of lymph in the pupil; the tendency to greenish discoloration of the iris; the occasional deepening of the anterior

chamber from increased secretion of aqueous humor; the dull aching character of the pain; the age of the subject, and oftentimes his ascertained proneness to rheumatic disease. For in most cases additional evidence will be elicited, upon inquiry, that the patient is subject to gout or rheumatism. The latter may be pure, produced by exposure to atmospheric vicissitude, etc., or may have resulted from gonorrhœa, or as a kind of tertiary vestige of syphilis.

Not every case of virulent inflammation occurring in the protracted course of venereal disease is syphilitic. Such inflammation, resulting as a sequela of gonorrhœa, being in reality a development of the rheumatism induced by the previous malady, cannot justly be denominated gonorrhœal iritis, the connecting link of rheumatism being essential to its production. So rheumatism—originating partly from syphilitic taint, partly from exposure while the patient was taking mercury for its cure—not unfrequently ushers in an attack of iritis. But, as in the parallel case just cited, though this would not have existed had the patient never contracted the antecedent disease, yet it cannot on that account fairly be regarded as truly syphilitic, but at most as an iritis of mixed elements, and therefore of mixed characters.

The incipiency of syphilitic iritis is indicated, as in other kinds of iritis, by uneasiness or pain in the affected globe, together with a bloodshot appearance of the eye, dependent on morbid vascularity of the conjunctiva and sclerotica. But it soon assumes its specific characters. The conjunctiva, stretched across the cornea, loses its brilliant polish, and becomes dull, like glass which has been breathed upon. The substance of the cornea main-

tains, in great measure, its transparency, but often exhibits at its lower part a number of minute, dusky specks, each surrounded with an inflammatory halo. The occurrence of these specks is not a constant feature in syphilitic iritis, nor are they absolutely pathognomonic; still they are frequent, and so generally confined to syphilitic cases as, when discovered, to afford the strongest presumption of the complaint being of that class.

The aqueous membrane does not commonly participate much in the inflammation, but in the majority of instances allows the iris to be fairly within view. This membrane undergoes a remarkable series of morbid changes, beginning with loss of brilliancy; its structure becomes thickened, and the edge of the pupil less sharp than before. The thickening or tumefaction usually proceeds more at some two or three points near the pupillary border than elsewhere. These spots consequently rise above the general plane, and assume a certain degree of prominence; their surface, too, becomes reddish-brown or cinnamon-colored. They are commonly termed "tubercles," not from any resemblance to phthisical or serofulous products, but simply from their nodular or protuberant aspect. Sometimes the central and most elevated point of a tubercle, losing its dusky red, assumes a yellowish white color, owing to suppuration within. Shortly afterwards the little abscess bursting, there is found a collection of matter at the bottom of the anterior chamber in the angle formed between the corner and iris. This, of course, constitutes hypopyon. Some fibrinous exudation within the pupil invariably takes place opposite each tubercle, and occasionally flakes of lymph are poured out upon the anterior surface of the iris, which affords a coating to the

tubercles, and shrouds the changes they undergo. Vision is affected in a variable degree, according to the amount of opaque lymph effused, and the height of sympathetic action in the choroid and retina. Hence, impairment of sight ranges from mere mistiness or trifling indistinctness of vision, to its almost utter obliteration on the diseased side.

The accompanying pain is, in the majority of instances, considerable, and in some it is very distressing, particularly at night. Its principal seats are upon the forehead and temple, and about the globe of the eye.

Intolerance of light is not uncommonly, in this as in the simple disease, more apparent than real. I have occasionally found small absorbent glands, situated over the parotid, swollen and hardened; but this is not, I think, confined (as supposed by the French surgeon who first made the observation) to syphilitic cases. The choroid may become affected, and those changes of size, form and color at last take place in the sclerotica, which are comprehended in the term staphyloma.

In cases so advanced as this, the functions of the retina are materially impaired, while before the morbid change is complete, the iris always becomes extensively adherent to the capsule of the lens, and the area of the pupil obstructed by organized lymph. The eye, in short, is almost entirely destroyed, for the degree of vision which can be restored by operation is limited in the extreme.

*Atrophy*, the opposite condition to that just described, is another consequence of uncontrolled syphilitic iritis. Here, also, the iris will always be found adherent to the crystalline capsule, and the pupil filled by false cataract, while vision is, of course, irrecoverably extinct.

The contrast between arthritic and syphilitic iritis is obvious. The prevailing feature of the former is, that it chiefly affects the quasi-serous covering of the iris with the scleroteca. Hence the extensive sclerotic injection, and the aching, dull pain; hence the occasional excess of aqueous fluid and distention of the anterior chamber; hence, also, the copious effusions of plastic lymph in both chambers, the early cohesion of the edge of the pupil and capsule of the lens, and the frequent obstruction or obliteration of that aperture by organized fibrin. In these phenomena, which especially distinguish arthritic iritis, we have the analogues of those which occur in rheumatic inflammation of the synovial capsules and of the pericardium. The syphilitic malady on the contrary is, essentially an affection of the substance of the iris, so much so, that the term "iritis parenchymatosc," has been proposed as a proper name for it. From this cause are produced the very symptoms on which we rely for its recognition, viz: the bluntness of the pupillary edge, the thickening of the texture of the iris, the elevation of certain points of its surface in nodular protuberances, the general restriction of lymph-exudation upon its free surface to those most prominent spots, the redness of the defined margin, the progressive interstitial growth of these tubercles, and their occasional softening and suppuration. All these phenomena have their origin in the fact that the pathological nature of syphilitic iritis is that of phlegmonous inflammation of the substance of the affected organ, while in the arthritic disease are developed a series of symptoms referable to the superficial and consequently diffused character of the inflammation. It is therefore from the manifestation of this or that set of phenomena

respectively, that diagnosis in any given case of iritis is effected.

The tubercular thickening characteristic of the specific disease exactly corresponds with the defined induration surrounding "Hunterian" chancrea, or occurring in syphilitic tubercular eruptions, and in nodes tenac.

*Treatment.*—The first requisite is removal of the exciting cause, by secluding the patient from exposure to atmospheric vicissitude, and extracting any extraneous body which may have occasioned the disease. Such measures having been premised, the treatment, more strictly so called, may be proceeded with according to the circumstances of the case, the principal indications being to subdue inflammatory excitement, and to check its extension to adjacent structures, to relieve pain, and prevent, if possible, if not to remedy, effusions upon the retina and within the pupil. The general character of our treatment is therefore antiphlogistic. Venesection may now and then be expedient in plethoric persons accustomed to indulgence at table, and who exhibit the usual evidence of hyperæmia in over action of the heart and arteries. But I would have such a case regarded as exceptional; I have not met with one in many years of hospital practice. Local abstraction of blood, on the contrary, is, in the great majority of instances, an essential measure. The quantity taken by cupping may vary from six to twelve ounces, according to the acuteness of the case and the condition of the patient. Thus, if the disease is brought early under observation, and exhibits a great degree of severity; if the pain is acute and distressing; the vision much impaired, and the appearance of the eye indicative of excessive inflammatory action, the superficial tunics

being vividly red ; if the anterior chamber be very muddy, and the iris already deprived of its natural mobility and color, and forming morbid attachments to the capsule of the lens ; and if the patient, at the same time, manifests competent constitutional energy, then the full amount of blood just named should be withdrawn from the temple. A larger quantity I scarcely ever recommend to be taken at first, even in aggravated cases, but prefer to note the effect produced by this, supported by other remedies. It is easy to have recourse a second time to the cupping-glass, at an interval of twenty-four or forty-eight hours ; and it is better to do so, than risk a needless amount of depletion at first. We continually find persons express a sense of immediate relief and diminution of suffering, even while the blood is being withdrawn. Leeches are most useful when (as is not unusual in arthritic cases) the superficial tunics partake largely in the inflammation. They may also be employed to follow up mildly the effects of the more active remedy. These measures having been premised, and the intestinal canal having been cleared by appropriate medicine, the next step is to administer mercury in doses proportioned to the severity of the case and the constitutional vigor of the patient. In the syphilitic disease this medicine is, in fact, our sheet-anchor ; and where the inflammation is acute, and the strength of the patient will admit of it, calomel should be exhibited in one or two grain doses three times a day, and persevered with steadily, until the gum begins to show signs of the establishment of mercurial influence on the system, or, which is tantamount to this, until the complaint begins to recede. In either event, the dose should at once be moderated, as actual salivation is never called for. Indeed, in

the great majority of cases, the effect becomes apparent upon the disease before either the guns, tongue, throat, breath, or salivary secretion betrays any evidence of the action of the medicine. We have then no need to push mercury farther; no benefit accrues, but the reverse often does, from insisting on the production of its physiological effects. Its therapeutic effects (if I may be allowed the distinction) are what we require, and what we generally may fully obtain, quite independently of the other class. To check any purgative effects of the calomel, which in syphilitic iritis is not desirable, I consider the use of chalk mixture preferable to combining opium with the pills, the latter drug having, as is well known, a tendency to cause contraction of the pupil, which, in iritis of all kinds, it is so necessary to prevent. In syphilitic cases of milder character, or occurring in subjects of impaired general powers, calomel must be given in smaller doses, and be less frequently repeated. The mercurial part of the treatment is, in such instances, similar to that which is usually sufficient in simple and arthritic iritis. Here the exhibition of a grain of calomel, or five grains of mercury pill, or lead pill, night and morning, is commonly the full extent to which mercurials should be carried; and even this quantity should be diminished as soon as the subsidence of the disease permits. When iritis ensues upon an operation for the extraction of cataraet, mercury must be altogether withheld until the flap has firmly adhered, and then, if required, should be given in extremely small doses, for fear of preventing or disturbing the union of the edges. With this exception, the initiatory measures of depletion and the employment of mercury are applicable (with a proviso as to the degree of activity requisite in

carrying them out) to all species of iritis. The further progress of the treatment is, however, in several respects, different in details. In arthritic cases, after the use of the means already spoken of, should there be considerable pain, disturbing the patient's rest at night, the extract of conium may be given in doses of from five to ten grains, twice or three times a day. Conium seems occasionally to exert a specific influence over arthritic inflammation of the eye, so that it may occasionally be exhibited, to the exclusion of any other except local remedies. Its beneficial influence, however, is not always manifested in an equal degree. Hence, the moderate use of mercury is preferable, which should be accompanied by alkalies, saline purges and colchicum.

When the acute stage has passed, and the complaint is retroceding, a few grains of powdered bark generally assist in re-establishing tone in the vessels, and in repressing lingering congestion. At the same time, a corresponding improvement in diet should take place; for at the commencement, in every form of iritis, spirits and fermented liquors must be forbidden; and when the patient's age or debility contra-indicates his restriction to soups and farinaceous food, the quantity of meat allowed, at least, should be very moderate.

In thus describing the next course of constitutional treatment, I have not referred to a potent and sometimes admirable remedy,aconite. The action of this drug is uncertain, and in ineautiful hands it has been productive of serious and even fatal consequences. Hence, it is best to reserve aconite for cases which resist the ordinary course of treatment, and continue it only with constant observation. Under such circumstances, ten minimis of the tinc-

ture may be prescribed three daily, the effects being carefully watched. I have witnessed the greatest benefit from this medicine, but am far from recommending its indiscriminate administration. In simple iritis there is in general, at the outset, no call for other internal remedies than mercurials, guarding against their acting purgatively. In the syphilitic disease, if, as frequently happens, the patient is tormented by racking pain about the globe, forehead and temple, with nocturnal exacerbations, we may be compelled to prescribe an opiate, and then the compound ipecacuanha powder, or, which is better, one of the preparations of morphia. Indeed, should full dilatation of the pupil have been obtained by belladonna, the objection to the internal use of opium falls to the ground, and any preparation deemed best suited to the case may be administered. The benefit of these anodynes is not simply palliative, but by tranquillizing the irritable frame of the patient, and perhaps procuring sleep, they contribute to place his system in a more favorable condition for receiving the curative impressions of other remedies. Much likewise may be done in allaying pain in all forms of the disease by the mercury and opium ointment, or the belladonna liniment rubbed in over the seat of pain around the orbit.

Pain is not unfrequently created by the application of belladonna to the brow in arthritic cases, apparently from the tension excited in the contractile fibres of the membrane affected with rheumatism. Such appears the simplest explanation of the circumstances, for the pain subsides on removal of the belladonna, and is clearly of the rheumatic kind.

Notwithstanding this occasional inconvenience, it is

right in all cases of iritis, including those of the arthritic kind, to apply belladonna; in the majority of instances its effects prove wholly salutary. When deprived of this most valuable auxiliary, in order to avoid, as far as possible, contraction of the pupil, we must keep the patient in a darkened room, and abstain from the exhibition of opium. As a general rule, the moistened extract should be applied night and morning around and over the palpebræ, and prevented from becoming dry and inert in the interval. I think this mode better, while the inflammation remains, than applying a solution of belladonna or atropine to the conjunctiva. In young children it is safer to use the remedy in the form of a plaster, to avoid the liability of it being conveyed to the mouth. The utility of this application in the early stages of iritis originates thus: The posterior aqueous chamber, owing to the convexity of the lens, is much shallower towards the axis of vision, or opposite the centre of the pupil, (where the posterior wall of the capsule bulges forward, and approaches the plane of the iris,) than at the periphery. The more, therefore, the pupil is dilated, the further is its edge removed from the capsule, and *vice versa*. Hence, a dilated pupil is less liable than a contracted one to form adhesions; the adhesions if formed are longer, while of course there is greater probability of preventing some portion of a large pupil from being overspread than there is when it is small.

At a later stage, the object of applying belladonna is, first, to save any portion of the pupil remaining permeable, and of its margin yet unattached; and, secondly, to obtain if possible, as inflammation subsides, the elongation and eventual rupture of adhesions already formed.

And here I must mention incidentally a physiological fact, demonstrated by our occasional success in effecting the liberation of the iris after adhesion, and by the phenomena which precede such liberation. It is, that dilatation of the pupil is not merely a passive result of relaxation of the force which produces contraction, but is itself an active change. Thus, in a case where adhesions have formed, when the pupil expands under the influence of belladonna, we may notice that the margin of the iris is arched or deeply recessed from adhesion to adhesion, evidently by the exertion of an active dilating power upon the intervening spaces. We see, moreover, that the morbid bands connecting the edge of the iris to the capsule are maintained in a state of absolute tension so long as the belladonna is kept applied, and these *fræna* remain unbroken. Hence, it is plain that dilatation of the pupil is no more a painful state than contraction—an inference confirmed by the occasional rupture of such adhesions and disengagement of the iris, as also by the disentanglement of the membrane from apertures in the cornea effected by the use of the same remedial application, belladonna.

We are more frequently successful in effecting the detachment of adhesions in cases of syphilitic than of arthritic iritis. In the former, the adhesions commonly assume the shape of narrow bands, at the points where the greatest thickening or tuberculation of the iris has occurred. In arthritic iritis, the inflammation being more diffused, the adhesions are usually broad, and involve a large part of the margin of the pupil; they possess, therefore, much greater firmness and power of resistance to the action of belladonna than do those of a syphilitic kind, in which, consequently, we apply the ex-

tract, even in advanced stages of the disease, with better hope of success.

*Mr. Carmichael*, of Dublin, introduced the use of turpentine in syphilitic iritis to the notice of the profession some years since. Of its remedial effects in these cases there can be no doubt. I have exhibited it, and had occasion to be satisfied of the truth of this statement. But the medicine is very apt to disagree, and act violently upon the kidney, so that in many instances its administration cannot be persisted in; while, when borne, its power over the disease is inferior to that of mercury. Were we able to give mercury only in one fixed dose, repeated at unvarying intervals, then, indeed, turpentine might often be a more eligible remedy; but as we can adapt the dose of mercury at once to the exigencies of the part and of the constitution, and these are seldom really at variance, we have little need of a medicine which, though sometimes efficacious, is often irritating and distressing, and always uncertain. However, in cases of no great acuteness, which do not yield so readily as expected under mercury, assisted by the remedies above enumerated, there can be no objection to giving oil of turpentine a trial. *A drachm* may be given three times a day, or every six hours, made into an emulsion with milk or almond mixture, the patient being warned of the probability of some little interference with the functions of the urinary organs. Should such inconvenience intervene, we should obviate it, if possible, by quietude and alkaline drink; if this fail, intermit or altogether relinquish the use of turpentine, especially if the urine become tinged with blood, and pain arise in the loins. As iritis becomes chronic and subsides, the mercury should be fur-

ther diminished. It must be entirely abandoned when once the external marks of the inflammation have disappeared and vision has regained its former degree of perfection. When we have failed to prevent the formation of a film or lymph within the pupil, still by steady perseverance with an alterative course, assisted by sarsaparilla with soda and iodide of potassium, or, in syphilitic cases, with nitric acid, much diminution of the density of the effusion and improvement of vision may generally be effected. When the final failure of these endeavors is certain, though the globe in other respects retain the general indication of health, and the patient is capable of distinguishing the transit of an opaque body before the eye, there is yet a prospect of affording relief by operation. If the other eye be previously lost, such operation is to be recommended. In the chronic stage of all species of the disease there are no more useful auxiliaries than blisters applied behind the ear or to the nape of the neck, of which situations the former is preferable. Never let the blister be placed on the temple or forehead for the relief of inflammation of the eye, for almost invariably the symptoms will be aggravated by the application, which, from undue proximity to the affected part, becomes a direct instead of a counter-irritant. You will probably have reason to observe, even in cases checked at an early stage of the disease, the great tendency of one attack of iritis to engender liability to another; a little exposure, indiscreet indulgence, or over-exertion of the eye, being often sufficient to reproduce impairment of vision, vascularity and dullness of the iris and anterior chamber. These relapses must be promptly met by a modified use of the same remedial measures which were employed in the

first instance. Owing to this tendency, a patient, on his recovery, should be cautioned against the imprudent exercise or exposure of the organ, for any fresh attack contributes, in its degree, towards ultimate destruction of vision.

#### ADDITIONAL REMARKS ON THE TREATMENT OF IRRITIS.

When it is desirable, as is often the ease, to continue the use of antiphlogistic measures at the same time that we are endeavoring to establish the mercurial action, we have given, says *Dr. Lawrence*, with much utility, calomel combined with nitrate of potassa and tartar emetic. The usual proportions are the following :

Rx Calomel, gr. viij.  
Potass. nitrat., 3 i.  
Antim. tart., gr. i.

To be made into eight powders—one to be given every four hours.

Two important questions present themselves respecting the mode of conducting this part of the treatment : first, to what extent mercury should be used ? And, secondly, how long it should be continued ? The more powerful its action on the system, the more effectually does it control the disease, putting a stop to the excitement of the capillary circulation, diminishing the size of the distended vessels, and preventing the further effusion of lymph, as well as its organization into those new structures which are so injurious to sight. Sometimes these ends are not accomplished by a slight action on the mouth, and larger doses will accordingly have to be given. Full salivation, quickly produced, cuts short recent disease as if by charm. The remedy may then be desisted from, and its effects

allowed to subside slowly, which will require two or three weeks. Although the disease yields more quickly and effectually to a powerful mercurial action, it will be sufficient, in general, to make the remedy sensible in the mouth. In cases of longer standing, its influence is not so soon effectual. But we must persevere until the lymph is absorbed, until the natural color of the iris returns, the red zone around the cornea is gone, and vision is restored. This, in some instances, will require four, six, or eight weeks. A longer time is usually necessary in relapses and subsequent attacks, than on the first occurrence of the complaint.

The good effects of the mercurial treatment appear most obvious when it has been resorted to after the failure of other measures. I have known it prove rapidly effectual in many cases, after active antiphlogistic means had been employed without success.

In some cases, where mercury has disagreed, or where, after a fair trial, the affection of the eye had either not improved or had become worse, I have lately employed with excellent effect the iodide of potassium, giving three or four grains in two or three ounces of the compound decoction of sarsaparilla, three times a day.

When the patient complains of severe pain over the orbit at night, his suffering may be greatly alleviated by rubbing the mercurial ointment, combined with opium, on the neighboring integuments of the forehead and temple. Eight or ten grains of the ointment, with two grains of finely powdered opium, should be well rubbed in before the period of the expected nocturnal paroxysm. A larger proportion of both ingredients is sometimes used. *Jünken* advises 20 to 30 gr. of the ointment with 10 to

15 gr. of opium for each friction. By this mode of proceeding, for which we are indebted to the Germans, painful attacks will generally be prevented. The benefit, however, is confined to the relief of this particular symptom. Mercurial frictions on the brow are not so effectual as the internal use of the remedy in arresting the inflammation.

We have used with great advantage, in arthritic iritis, colchicum combined with purgatives, in the form of Scudamore's draught, with the addition of oil of turpentine. Our formula is the following :

Rx	Magnes. sulph.,	ʒ iv—ʒ vis.
	Magnes. carb.,	ʒ ij.
	Vin. rad. colchici,	ʒ i—ʒ ij.
	Ol. terebinth.,	ʒ i—ʒ ij.
	Syrup cort. aurant.,*	ʒ i.
	Aq. carbonat.,	ʒ vij.

Dose, one to two ounces, two, three, or four times a day.

*Mr. Morgan*, in his lecture on iritis, remarks : "Bark, which in some cases of rheumatism has been found useful, is an exceedingly good medicine in rheumatic iritis, particularly when combined with alkali." The following is a useful formula for its exhibition :

Rx	Pulv. cinchon.,	gr. v.
	Sodaæ Carb.,	ʒ i.
	Fiat. pulv. ter in die sumend.	

*Mr. France*, in his note to Morgan's Lectures, adds: In the treatment of arthritic iritis, after the employment of cupping and of some brisk purge, as a powder of calomel and jalap, a very useful form of medicine, when general power is not very defective, previous to exhibiting bark,

\* Or some other agreeable syrup.

is a draught consisting of a drachm of sulphate and ten grains of carbonate of magnesia, with twenty or thirty minims of colchicum wine in mint water, to be given thrice daily. At the same time, five grains of the compound calomel pill should be given at least every night. The bowels being thus freely acted upon, as directed, and the violence of the inflammation being thereby somewhat abated, the case will be better prepared to derive benefit from the bark, and the dose of mercury may then, with perfect safety, be diminished to a mere alterative.

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## SECTION V.

### DISEASES OF THE LACHRYMAL ORGANS.

*I. Of Inflammation of the Lachrymal Gland.*—The lachrymal gland, though often inflamed along with the other contents of the orbit, is seldom affected with inflammation alone.

Inflammation of the lachrymal gland, however, has been observed in serofulous subjects. In these cases, the gland enlarged and protruded from between the temporal extremity of the eyelids. In some the inflammation has terminated in suppuration, by which a fistulous opening formed, in consequence of the exudation of the tears along with the matter discharged.

*II. Of Scirrhous and Cancer of the Lachrymal Gland.*—Cases of scirrhous and cancer of the lachrymal gland are not unfrequent. In some cases, this gland alone is affected with these diseases; in others, it partakes of the disease along with the other appendages of the eye.

This disease is characterized by chronic enlargement and induration of the gland, accompanied with occasional severe lancinating pain and burning heat in the part. In some cases, an ulceration takes place in the skin covering it, showing a distinctly carcinomatous character, by having an elevated indurated and tuberculated margin,—much pain at times, a foul appearance, and giving out a thin fetid discharge. By slow degrees this ulceration affects the surrounding parts—the eyelids and other appendages of the eye becoming involved in the disease.

The lachrymal gland has frequently been removed on account of this disease. Its early removal appearing to be the only chance of a cure and the only means of preventing the neighboring parts from becoming affected. The extirpation of the lachrymal gland is not a difficult operation. It is to be performed by dividing the external angle of the eyelids, by an incision of about half an inch in length towards the temple. The tumor then becomes exposed, and is to be laid hold of with a hook, and dissected out. The integuments are then to be brought together by a stitch, compress and bandage, and the cure is afterwards to be conducted as in other similar surgical operations.

*III. Of Obstructions of the lateral Lachrymal Canals.*—The absorption and passage of the tears to the lachrymal sac is sometimes prevented by relaxation or obstruction of one or both of the lateral lachrymal canals. In either of these cases the eye is overflowed by the tears, which pour over the cheek, constituting the disease known by the names of *weeping eye*, *epiphora*, *vel. stillicidium lachrymarum*, etc. The obstruction is known to exist in the lateral canals by the sac being empty.

When relaxation of the puncta or of the eye-lids, as in elderly persons, prevents their absorbing the tears, the introduction of gentle stimuli and astringents into the eye has a beneficial effect. These may consist of drops of vinum opii, solution of sulphate of zinc, or of nitrate of silver, made with two or three grains to an ounce of water. These may be dropped into the eye, night and morning, and the eye-lids may be bathed two or three times a day with a weak solution of the acetate of lead or sulphate of zinc. When there is any excoriation of the edges of the eye-lids, a weak ointment of the oxyd or nitrate of mercury should also be applied. When the lachrymal puncta are closed, the point of a very small probe may in general be introduced into them. When the punctum is rendered pervious, a small probe can then, in most cases, be introduced through the lachrymal canal to the sac. In effecting this, however, the direction of the canal, which is by no means straight, must be humored.

These canals only become imperforate from the healing of wounds, in which cases I am not aware that the passage can be restored; one of the puncta, however, is capable of performing the function of both.

*IV. Of Acute Inflammation of the Lachrymal Sac and Duct.*—The lachrymal sac and duct are often affected with acute inflammation, from injuries and other accidental causes. In the situation of the lachrymal sac, immediately below the insertion of the tendon of the orbicularis palpebrarum muscle, a circumscribed, hard and painful swelling arises. This tumor is commonly of a round or oblong form, is tender to the touch, and acquires a reddish color, from the integuments over it becoming in-

flamed. In consequence of the inflammation and swelling of the ducts connected with the lachrymal sac, the tears are prevented from passing to the nose, so that they overflow the eye and run over the cheek. Sometimes inflammation of an erysipelatous character affects the integuments around the eye. When the degree of inflammation is great, the patient is affected with symptomatic inflammatory fever.

When this inflammation of the lachrymal sack has continued for a few days, and does not terminate by resolution, a copious secretion of muco-purulent matter takes place from the internal surface of the sac. By this morbid secretion the sac is distended, in consequence of its evaeuation being prevented by the swelling of the lachrymal ducts. The sae, therefore, beeomes distended to a considerable size, being unconfined by the bone at this part. The tumor enlarges and progresses till it bursts externally through the integuments. The skin becomes redder, more tense, and painful, with a sense of throbbing in the tumor, after which a yellow spot appears at its apex and the skin gives way, thus giving passage to the contents of the tumor through an ulcerated opening, made in the sac, the fibres of the orbicularis muscle, and the skin. By the application of emollient and soothing remedies, the inflammation now declines, the discharge from the sac diminishes, consisting at last only of mucus, the external opening cicatrizes, the tears are absorbed by the lachrymal puneta, and are conveyed through their natural course to the nōse.

Acute inflammation of the lachrymal sac may arise from injuries or other accidental causes, but it may take place spontaneously, or from obstruction of the nasal duct.

Inflammation of the lachrymal sac and duct may terminate either by resolution, (effusion of lymph,) or by suppuration; the last of which is, in some cases, accompanied with sloughing of the integuments covering the sac. In some cases, where the patient is of an unhealthy constitution, after the bursting of the tumor, the inflammation continues and assumes a chronic form, often terminating in a permanent obstruction of the nasal duct; so that the tears and mucus continue to flow out through the ulcerated opening, and the affection degenerates into the disease termed fistula lachrymalis, to be hereafter described. In some cases of inflammatory tumor in the situation of the lachrymal sac, it is not easy to determine whether the inflammation affects the sac or is confined to the parts covering it. But this is not of much importance, for whether the abscess forms in the sac or affects only the skin, the mode of treatment in this state of the disease is the same. This consists in the application of antiphlogistic and soothing emollient applications, and the evacuation of the matter by means of the lancet, when the tumor has ripened sufficiently. Whether the opening communicates with the sac or not, the introduction of probes, and all other causes of irritation, are, in this affection, carefully to be avoided, as they would only prove hurtful.

In the early stage of the affection, general and local blood-letting with purgatives, and the application of cooling lotions consisting either of a solution of the acetate of lead, or the acetate of ammonia, should be employed, to promote the termination of the inflammation by resolution. When the termination of the complaint by resolu-

tion is no longer to be expected, warm emollient poultices are to be applied to promote suppuration.

Whenever the tumor points externally, an opening should be made with a lancet. An opening made in this way heals more readily, and leaves a smaller cicatrix, it removes the pain, and prevents the increase of the tumor and sloughing of the integuments.

The poultices are to be continued after the opening of the tumor, until the pain and inflammation have abated; after which the application of simple dressings will be sufficient to complete the cure.

When a permanent obstruction of the nasal duct takes place, and the opening into the sac becomes fistulous, the case requires to be treated in the manner recommended for this affection.

*V. Of Obstruction of the Nasal Duct, Enlargement of the Lachrymal Sac, and Fistula Lachrymalis.*—Obstructions of the nasal duct from inflammation, either acute or chronic, are not of unfrequent occurrence. Such obstructions take place from thickening of the coats of the duct, contracting its diameter, and, in some cases, proceeding to complete obliteration of its canal. The enlargement and inflammation followed by the bursting of the lachrymal sac, generally follow the obstruction of the nasal duct. When an external opening takes place in the sac, the tears, mixed with muco-purulent matter, are evacuated from it, and this constitutes the disease termed *fistula lachrymalis*. Inflammation and suppuration of the skin covering the sac, are liable to be mistaken for inflammation and suppuration of the sac itself. When the sac is affected, the tears and matter flow out at the puncta when the tumor is pressed upon, which is not the case when the skin only

is affected. Sometimes, however, an abscess of the skin bursts into the sac, as well as externally.

This disease—*fistula lacrymalis*—has been divided into four stages or degrees.

*First Stage*, or chronic enlargement of the sac without inflammation.—An enlargement, or preternatural distension of the lachrymal sac, forms a distinctly circumscribed tumor at the inner or nasal angle of the eye, immediately below the insertion of the orbicularis muscle. When this tumor is not attended with pain or inflammation, it can be completely emptied by pressure with the point of the finger, the contents of the sac, which consist of tears mixed with mucus, being evacuated either upward through the puncta lachrymalia, or downward through the nasal duct into the nose. This pressure, which is necessary for evacuating the contents of the sac, the patient is generally in the habit of employing himself, from time to time, to obtain temporary relief. Pressure being required to empty the sac, it shows that there is some obstruction of the nasal duct. The distension of the sac indicates the obstruction, while the passing of the contents to the nose on pressure shows that the passage is still open. The distended sac often attains a considerable size from its readily yielding at this part, where it is not confined by the bones. The tears, by their passage into the nose, being obstructed after the sac is distended, pass over the cheek, which constitutes a form of the “weeping eye.” This state is very inconvenient to the patient, particularly when the flow of tears is increased by exposure to cold air, etc.

This stage of the disease does not constitute a true *fistula lacrymalis*, for there is yet no external fistulous

opening into the sac. The affection may remain in this state, and advance no further than the first stage; the sac being relieved from time to time, by the evacuation of its contents by external pressure. When the tumor becomes inflamed, the disease assumes a new character, and passes to the second stage.

The first stage of this complaint has been described as a distinct disease, and from some has obtained the appellation of hernia, relaxation, and dropsy of the sac.

*Second Stage.*—Inflammation of the enlarged and distended lacrymal sac constitutes the second stage of fistula lacrymalis. The tumor becomes painful, and has acquired a red color, which is often not confined to the circumscribed tumor, but diffused over a considerable portion of the surrounding skin; and the surface of the inflamed parts, from the swelling and tension, attains a clear shining appearance.

In this stage of the disease, suppuration very soon takes place; so that purulent matter is effused into the interior of the sac, from the inflamed surface of its mucous membrane. When the contents of the sac therefore are evacuated either by the puncta lacrymalia, or by an opening made through the skin into the sac, tears mixed with pus and mucus flow out.

When the inflammation of the sac is considerable, and has continued for some days, the accumulation of matter within it makes it point externally like a common abscess; the pain and tension subside, and a throbbing sensation may be felt in it; after which, it bursts below the angle of the eye, and allows its contents to escape, when not previously opened by the lancet.

When an opening into the sac has been thus estab-

lished, the disease passes into its third stage, and becomes a true laehrymal fistula. The tears, instead of passing over the cheek, as in the preceding stages of the disease, are now absorbed by the puncta and carried into the sac, passing out at the external opening along with the mucopurulent secretion; being prevented by the obstruction of the nasal duct from passing into the nose.

This affection of the lachrymal sac, which has now been described as the second stage of fistula lachrymalis, may occur without having been preceded by the first stage. (See acute inflammation of the lachrymal sac and duct.) The second stage of the disease—*inflammatory tumor* of the sac—is liable to be confounded with erysipelas, or a simple inflammatory tumor of the skin at that part; for, the pressure, caused by the inflamed skin upon the sac, causes the tears to flow over the cheek. But when, by pressure with the point of the finger, the contents of the tumor can be evacuated through the laehrymal puncta, there can be little doubt of the disease being situated in the laehrymal sac. Because this evacuation of the tumor could not take place, were the tumor distinct and unconnected with the sac, unless a communication existed between the abscess and the sac, in which case, the matter would more readily find its way into the nose by the nasal duct, than through the lachrymal puncta. In case of an abscess of the skin opening into the lachrymal sac, the tumor can never again become distended, even though the external opening should close, as the matter will afterwards find its way into the nose. By attention to these circumstances, therefore, an accurate diagnosis may be formed.

*Third Stage.*—When the tumor of the lachrymal sac

has been inflamed, succeeded by suppuration, on being opened, or bursting externally, the third stage or true laehrymal fistula is formed. The tears and contents of the inflamed sac flow out by the external opening, its edges become callous, and have no disposition to heal; the cicatrization of the opening being prevented by the continual discharge, unless the passage through the nose be restored. If, upon the subsiding of the inflammation, the obstruction of the nasal duct is removed, giving passage to the tears and secretion from the sac, the external opening heals, and the patient gradually gets well. In some cases, the sac fills again and becomes distended as before. In others a small part of the opening remains disunited, and allows the fluid from the sac to ooze constantly through it. In these last cases, if nothing be applied to the sore, the matter dries as it exudes, and forms a crust or scab on the opening. The disease has very often progressed to this state, before the patient first applies to the surgeon for relief.

When the tumor has burst spontaneously, the opening through the skin is, in many cases, not exactly opposite to that in the sac. This arises from matter having escaped from the sac, and extravasated into the cellular tissue before the skin gave way. When the nasal duct is examined, by introducing a probe through the opening into the laehrymal sac, an obstruction is found to exist. This obstruction varies in degree from that caused by a slight contraction of the passage, by the thickening of its lining membrane, to a complete obliteration of it. The obliteration of the nasal duct constitutes one form of the fourth stage of the disease.

*Fourth Stage.*—By the long continuance of the second

and third stages of fistula lachrymalis, a complete disorganization of the lachrymal sac and duct is produced. The continued inflammation causes the complete closure and obliteration of the passage. When the external opening has continued for some time, the sac ulcerates; a fungous growth issues from the interior, and in many cases this is accompanied with a copious discharge of tears and matter, which is often followed by diseased and carious state of the os unguis. Chronic inflammation of the conjunctiva and edges of the eye-lids, frequently accompany the different stages of fistula lachrymalis.

From the description which has now been given of the different stages of fistula lachrymalis, it will be evident that they should not be considered as distinct diseases, but as different stages of the same disease, which pass into each other; each depending on the same cause, the obstruction of the nasal duct.

*Causes of Fistula Lachrymalis.*—The cause of each of the degrees or stages of fistula lachrymalis, is an obstruction to the passage of the tears in the nasal duct. The most common cause of this obstruction is inflammation of the lining or mucous membrane of the duct. The inflammation produces a thickening of this membrane, and, as it is confined within a bony canal, the interior of this duct becomes completely occupied, by the thickening of its texture and the effusion of lymph; and, consequently, it becomes partially or completely obstructed, and so hinders the tears from passing down to the nose. The inflammation causing obstruction of the nasal duct may be either of an acute or chronic character. By its continuance, a stricture, or complete obliteration of the passage, takes place.

*Treatment of Obstructions of the Lachrymal Duct and Fistula Lachrymalis.*—In describing this disease, it has been stated that by far the most common cause of it is the destruction of the nasal duct, occasioned either by contraction or obliteration of the canal of which it is composed. It is only by directing our efforts, therefore, to the removal of this obstruction, that the extirpation of the disease can be effected. Various modes have at different times been recommended and employed for the accomplishment of this object, and not until a very late period was its true nature or proper treatment distinctly understood.

The treatment of this disease requires to be varied and adapted according to the stages of the affection.

*Treatment of the First Stage.*—In the first stage of the disease, when there is enlargement without any inflammation of the sac, or complete obstruction of the nasal duct, the patient is frequently contented with the palliative remedy, consisting of the periodical evaeuation of the sac, by pressure with the finger. This state of the disease may continue for years, without giving the patient any further inconvenience. He, therefore, prefers the temporary relief to any more active treatment for its cure. The treatment of this stage of the disease, by injections with an Anel's syringe, together with the introduction of a small probe into the nasal duct, through one of the lateral lachrymal canals, has been recommended and continues to be employed.

The injection employed should, at first, consist of water, simply, and afterwards of a weak solution of acetate of lead or sulphate of zinc. But as fluids are absorbed by the lachrymal puncta, these solutions may

be introduced into the sac by dropping them into the inner angle of the eye, having previously emptied the sac by pressure with the finger. When these have been employed for some days without passing into the nose, a small probe is to be introduced through one of the lateral lachrymal canals. When the point of this probe has been passed so far as the lachrymal sac, its direction requires to be changed along with that of the lateral canal, from the horizontal to the perpendicular direction. In this position, the probe is to be passed downward and a little outward, towards the wing of the nose of the same side. In accomplishing this introduction of the probe, care must be taken not to penetrate through the mucous membrane of the canal with its point, which is necessarily small. This is to be avoided by pulling the probe a little back, and changing its direction, when it meets with any resistance before arriving at the seat of the obstruction. When resistance is felt at the obstructed part of the duct, it may, in general, be overcome by gently increased pressure upon the instrument. The introduction of the probe requires to be repeated at intervals of a day or two, and the size of the probe may be gradually increased.

When the obstruction of the nasal duct is ineconsiderable, by the repeated introduction of these probes and injections, the obstruction may be removed and the complaint cured. Should these combined means fail in procuring any material amendment in the local disease, and more particularly if the fluid contents of the sac cannot be pressed down into the nose, it may, in some cases, be well to probe the nasal duct from below, with the view of restoring the calibre of the canal. For this purpose, the

end of the curved probe is passed along the floor of the nostril, then turned up beneath the inferior turbinate bone, and having entered the opening of the duct, is gently pressed in the upward direction. I have seen this operation extensively employed, and have tested it myself; yet in my experience I agree with Dr. Franee, that leeching over the sac and at the inferior meatus of the nose, together with the measures above indicated, are entitled to greater confidence.

When the cure of the first stage of the complaint cannot be accomplished by the methods above described, an incision must be made into the lachrymal sac. By this operation the case is converted into one of the third stage of the disease, and is to be treated in the manner hereafter mentioned.

*Treatment of the Second Stage.*—When the enlarged sac and duct have become inflamed, the case requires to be treated in the manner already recommended for acute inflammation of these parts. If the tumor proceeds to suppuration, and if, instead of getting well, a fistulous opening becomes established, from obstruction and chronic inflammation of the nasal duct, the treatment required is as follows:

*Treatment of the Third Stage.*—The disease having become a true lachrymal fistula, it is necessary to restore the natural passage of the tears into the nose. This is to be done by removing the obstruction of the nasal duct. When the acute inflammation has been removed, in most cases, by perseverance, a probe can be introduced downward from the sac into the nose. When this has been done, all that is necessary is the introduction of some means of keeping the duct open. For this purpose, sev-

eral instruments have been employed. These consist, either of a small tube introduced down into the nose, and left there to convey the tears away; or of a solid body, called a stile, by the side of which the tears find a passage downward.

The introduction of the tube is an old method lately revived and recommended by M. Dupuytren. The introduction of the stile is that which is almost universally adopted. When the tube is introduced, the skin is allowed to heal over it; when the stile is employed, its head remains uncovered, by which it is occasionally withdrawn. The tube employed may consist either of lead or silver, made considerably broader at its upper than at its lower part, to prevent its passing too far down, or shifting its position. Some patients are completely cured by wearing the stile a few months, while with others it requires to be worn for years. From the little inconvenience it produces, it is better to continue it too long than to run the risk of a relapse. Mr. H. Walton, in his excellent work on "Operative Ophthalmic Surgery," remarks: "When there is a fistulous opening, the course to be pursued is plain. The channel is completely obstructed, and must be re-established. Prior to that advanced state, there may be differences of opinion as to the stage of the disease that imperatively calls for physical measures; but I think it may be laid down as a rule, that when the obstruction involves the necessity of emptying the tube of its accumulations by pressure, the time to employ them has arrived; and to delay their use until, from continued morbid action, there is material structural change in the tube, must tend very much to lessen their advantage, and to favor the formation of abscess, and its common result—fistula.

"The solid nail-headed, silver stile is, according to the present state of our knowledge, the most appropriate local adjunct, notwithstanding its drawback of slight disfigurement, and rather unscientific manner of application. It requires some tact to introduce this little instrument readily and neatly. The usual direction to find the spot for insertion, by pulling the lids outward, and making tense the tendo-oculi, is not applicable when disease exists. Indeed, with much swelling and induration, there is not any land-mark absolutely trustworthy; but so long as the lower and internal angle of the orbit can be felt, it may form an unerring guide. The correct place for the aperture corresponds externally to a spot a little below and internal to the inferior punctum. With the fore-finger of the left hand placed on that part of the edge of the orbit that stands in front of the bony canal, to give the idea of the level and of the distance of the tube from the surface, the knife, with the edge outward, should be entered below and internal to the punctum, carried a little inward behind the ridge of bone, and then downward, inclining slightly outward, and backward to the required extent. It is needless to attempt to pass the knife while the point is in contact with the bone, for the right course has been missed. When the instrument is adroitly used, a bony surface is not touched. Slight as the operation may be, I would advise no one to undertake it, unless he has seen it done before, or can do it with perfect confidence.

*Treatment of the Fourth Stage.*—When there is a complete obliteration of the nasal duct, it will be found that by the use of the stile, the duct continues open and the tears are conducted to the nose, the case is then to be treated precisely as in the third stage of the disease.

When the affection is accompanied with a fungous state of the lachrymal sac, the application of escharotics is requisite to remove it. When there is, also, a carious state of the os unguis, as soon as the diseased bone exfoliates, the case is to be treated in the manner before mentioned, according to the degree of the disease.

# DISEASES OF THE EYE.

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## PART THIRD.

### SECTION I.

#### DISEASES OF THE EYE-LIDS.

##### GENERAL PURE INFLAMMATION OF THE EYE-LIDS.

IN this affection the edges of the eye-lids assume a deep red hue, accompanied with a tense, hot and very painful swelling, which is extremely sensitive to the touch, and gradually extends over the whole lid, but becomes evidently bounded at the edge of the orbit. The patient and even the surgeon feel a pulsation in the eyelid. The eye-ball and nose become remarkably dry, and the lid can only be moved with a painful sensation, as if foreign sharp-pointed bodies lay under it; the patient has also a feeling of dust in the nose, which is often so strong as to cause him to sneeze, and is always accompanied with considerable increase of pain and an extension of it into the eye and head, and is also attended with a sensation of light in the eye, photopsia.

An inflammatory fever often accompanies these symptoms, in which case the disease has reached its acme. By degrees the redness of the swelling increases and becomes brownish or bluish-red. The swelling enlarges, assumes a conical shape, and becomes softer and less painful. The pain becomes irregular, lancinating and burning, and is

now only pulsating in the deep parts. The powers of secretion and excretion, which were at first suspended, are restored, and a sense of coldness and weight is felt in the region of the eye. The point of the swelling becomes soft, of a pale red or yellowish hue, and matter may be distinctly felt in it.

As the cause of this general inflammation of the eye-lids, Professor Beer has hitherto only observed slight wounds. The prognosis in the first stage is favorable when properly treated at the commencement : the inflammation will disappear, and the eye-lids perform their accustomed function. It will never, of course, result in suppuration. But if the inflammation be improperly treated, and fever supervene, gangrene or suppuration readily takes place. If gangrene has already commenced, the patient may be thankful if he loses only the external parts of the eye-lid, in consequence of which an ectropium or lagophthalmus permanently remains. If a healthy suppuration take place, and form no fistulæ, particularly in the lower eye-lids, a good cicatrization will for the most part ensue, which will not impede the movement of the eye-lid. If, however, the suppuration should from neglect proceed to a bad ichorous suppuration, then, in consequence of the loss of substance occasioned by it, there may very readily supervene adhesion, contraction, or total destruction of the canalicular lachrymales, and a consequent stillicidium lachrymarum, prolapsus of the upper eye-lid, and eversion or inversion of the eye-lid.

So long as an active inflammatory state of the eye-lid is present, and the disease is as yet local, apply poultices with cold water or *oxycrat*. If, however, inflammatory fever be already present, adopt a general and local anti-

phlogistic treatment, according to the degree of inflammation and kind of constitution. If the surgeon now perceive that suppuration can no longer be averted, he ought to promote it on the principles already laid down in the section on Inflammation of the Eyes in General. If an abscess forms upon the upper eye-lid, it will generally open spontaneously, without injury to the future form of the palpebra; if it forms in the angles of the eye-lids, or on the under lid, it must be opened with a lancet in the course of the fibres of the orbicularis muscle. When fistulae are already present in the eye-lids, it becomes necessary sometimes to form counter-openings, sometimes to enlarge them by the knife, or, when this is not necessary, by prepared sponge. Injections, and pressure of the wounds, when practicable, must effect the rest of the cure.

Should gangrene have attacked the eye-lid, the patient may be allowed a nourishing, easily digested diet. Volatile and permanently stimulating and tonic medicines, as calamus, old wine, bark, and the like, may be given. Apply poultices of willow or oak-bark, mixed with spirituous fluids, also Jesuit's bark; for example, the following by Le Februre:

Rx	Cort Chin.,	$\frac{3}{2}$ i
	Salis Ammoniac,	$\frac{3}{2}$ ij coq. c.
	Aq. fontan ad Colatur,	$\frac{3}{2}$ viij. adde.
	Camphor,	$\frac{3}{2}$ ij.
	Spirit. Vin. Rect.,	$\frac{3}{2}$ i.

To be applied to the lids by means of linen compresses.

#### OF ERYSIPELAS OF THE EYE-LIDS.

Erysipelatous inflammation of the eye-lids is not uncommon; the eye-lids may be affected alone, or they may

partake of erysipelas of the face and scalp. When the eye-lids are affected with erysipelas they become greatly swollen, tense, red, and painful, causing complete inability to open the eye. The eye-lids often become oedematous. The conjunctiva becomes affected with the inflammation, which terminates in a copious effusion of purulent matter from its surface. This inflammation, by spreading to other parts of the eye-ball, sometimes causes the disorganization of some of its parts. Like erysipelas of other parts of the body, this is often attended with violent inflammatory fever. This inflammation often terminates by the formation of an abscess, sloughing, and ulceration of the eye-lids. An inflammation of the eye-lids and eye-ball, of a somewhat similar description, takes place in cases of small pox, measles and other exanthematic diseases, as also in the other puriform inflammations of the conjunctiva.

*Treatment.*—Erysipelas of the eye-lids requires to be treated upon general principles, by antiphlogistic and other means; care being taken, at the same time, to treat the inflammation of the conjunctiva and eye-ball by the application of the remedies recommended for purulent ophthalmia.

#### PURE INFLAMMATION OF THE GLANDS OF THE EYE-LIDS.

This disease appears in the following manner: The edges of the eye-lids become affected with a bright red, hard, sensible swelling, accompanied with itching in the canthi, or even in the whole edge of the eye-lids, sometimes alternating with a sense of burning. The secretion of tears is at the same time more or less increased; they are acrid, and redden and excoriate the cheeks. If the

inflammation become gradually more severe, and extend over the conjunctiva of the eye-ball, the secretion of tears ceases and the eye becomes dry; the patient, in consequence, believes he feels sand under the eyelids, which he does not venture to move, from fear of pain. Thus proceeds the first stage, which sometimes passes so rapidly that the surgeon does not observe it.

By degrees the dryness and the burning and itching of the eye-lids diminish, the Meibomian glands begin to form mucus, by which the eye-lids and ciliæ are glued together, the conjunctiva palpebrarum is swelled and very red, the angles of the eye, and often the whole edges of the eyelids, become excoriated, and give to this inflammation sometimes a strong resemblance to psorophthalmia, the secretion of mucus also continues to increase in quantity and to become more puriform in substance. The disease has an exacerbation three or four hours after dinner and supper, when the chylification has commenced. By this time the edges of the eye-lids are often, as if eroded, painfully galled, and the excoriations spread always farther when the disease is left to itself.

A similar chronic oozing-out of puriform fluid has been in former times described under the name of lippitudo, as a peculiar form of disease. When the angles only suffered from a similar discharge, it was called lippitudo angularis, uncleanness of the canthi, lemositas; and if excoriations arose which corroded the canthi, it was called peribrosis perivrasis.

Often, when, from favorable circumstances, the puriform secretion of mucus abates, the excoriation also disappears, yet an unnatural secretion of Meibomian mucus still remains, which may become habitual. But, if this

secretion of mucus be removed by art or by accidentally favorable circumstances, the whole disease terminates with an unusual serous secretion.

The disease arises particularly in those who dwell in an impure, corrupted air, also in tanners. It attacks every age and sex, but is more commonly met with in females than in males. The prognosis is good, when the inflammation is met with in the first stage, and when not too severe. This inflammation, when pure, does not produce constitutional disorder, unless, by improper management, it has advanced to a blepharophthalmitis. If a flow of puriform mucus be already present, a trichiasis may readily happen; and when, at the same time, considerable exoriations of the edges of the eye-lids are present, an anchyloblepharon partiale may take place. If the exoriations be particularly severe in the angles of the eye-lids, and their commissures have become corroded, an eversion of the lower lid will commonly ensue, which, as it occurs most frequently in old relaxed subjects, is named ectropium senile. If the flow of mucus from the eyelids be very copious, and the treatment be by too cold or too astringent an eye-water and salve, (which may probably suppress it suddenly,) a permanent weakness of sight may follow, particularly in very irritable individuals.

When the disease is met with in its first stage, it may often be eradicated in its incipiency by cold poultices of water, or weak oxyerat. The noxious inducing causes of the affection must also be removed as far as may be possible. But when actual secretion of mucus has taken place, we may use, according to Beer, a very weak solution of sublimate, with mucilage of quince seed and laudan. liquid. Sydenh., washing the eye with

it from four to six times daily, and drying it carefully after each application.

Rx	Merc. sublim. corros.,	gr. i,	vel. ss.
	Aquaæ rosar.,	ʒ	iv.
	Mucilag. semi. cydon.,	ʒ	i.
	Laud. liquid Syd.,	ʒ	i. M. solvendo.

If excoriation be already present, or of some standing, then use the ungu. ophthalm. tanini., which consists of axung. porcin., ʒ ss.; tut. præpar. bol. Armen. aa ʒ ij, et merc. precip. alb., ʒ j; but it is to be remarked that the difference of individuals must be considered, for if the eye be already in an irritable state, or if the patient has great sensibility, the proportion of mercury and astringent substances must be diminished. As it is now known that the white bole is less astringent than the red, and the Armenian more so than either, it will be well, at the same time that the white precipitate is diminished, to add at first, in young, irritable subjects and children, the white bole in place of the Armenian, and to smear only the size of a lentil seed of the salve on the eye-lid once a day. In such patients the following will suffice:

Rx	Axung. porc.,	ʒ	ss.
	Bol. Alb.,	ʒ	iv.
	Merc. precip. alb.,	ʒ	ss.

Vigorous adult persons, on the other hand, bear very well the usual proportions of Janin's ointment. There are, however, persons who cannot bear the local application of mercury, and who derive no benefit from unguents. In such cases, recourse should be had to the lapis divinus of St. Ives, prepared according to the following formula:

Rx	Nitri. depurati.
	Vitriol cærul.
	Aluminis crud. a a ʒ viij.

Conrita et mixta fluant in crucibulo, quibus sub finem addatur eamphora tritæ oz. ss. rite agitata refrigerantur.

Even in the use of this application, the peculiarities of the patient must be considered. The more irritable the eye, and the longer the disease has continued, the less quantity must be dissolved in a certain proportion of water. At first, ten or fifteen grains dissolved in six to eight or ten ounces of water, and mixed with a drachm of spirit, is sufficient; it is to be gradually increased to thirty grains, dissolved in six or ten ounces of water, with the addition of spirits camphoræ. It is to be made always lukewarm, and applied by means of a fine sponge held over the eye, until the fluid entering it excites some smarting. It is to be used three or four times daily, and seldom during the decrease of the disease. The eye-water must never be allowed to become cold upon the eye.

Sometimes, when, under the influence of the most pernicious causes, and in cases of relaxed, callous, old people, the excoriation of the edges of the eye-lids increases more and more, and terminates in larger or smaller ulcers, which obstinately resist all the above means, recourse must be had to the use of the *ung. citrin.*, *pharmacop. London,\* recommended by James Ware*; and, in the worst cases, even to the local use of the *lapis infernalis*, of St. Ives, before referred to; the latter, however, must

\* It is prepared in the following manner :

Rx Hydrargyri. puri., ʒ i.  
Spirit nitr., ʒ ij.

Digere super arenam, ut fiat solutio, quæ calidissima adhuc misceatur cum axung. Poreinæ liquefactæ et in coagulum denuo tendentis libra una, strenne agitando in mortario marmores ut fiat unguentum.

The edges of the eye-lids are to be rubbed once daily, with this ointment, before going to bed.

be used with caution. These obstinate cases do not usually belong to the pure blepharophthalmia glandulosa, but are consequences of different caehectic diseases.

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## SECTION II.

### HORDEOLUM, OR STYE.

THIS disease consists of one or more small inflammatory tumors, attended with very considerable pain, which occur upon the margin of the eye-lids, at the roots of the eye-lashes, and orifices of the Meibomian ducts. The inflammation in these tumors commonly goes on to suppuration, terminating in a small pustule or boil. When suppuration commences, a small whitish point appears at the apex of the tumor; in a day or two this bursts, and sometimes a portion of the cellular tissue within the tumor sloughs and comes away. The tumor, therefore, has all the characteristics of a common boil, upon a small scale. During the first stage of the disease, when the tumor is of considerable size, the affected eye-lid becomes tumefied and affected with erysipelatous inflammation. In some cases, even the conjunctiva partakes of the inflammation. This disease most commonly affects young subjects. In many cases, there is such a constitutional proneness to it, that it often recurs by a succession of tumors taking place. This depends upon some peculiar condition of the system. Those of scrofulous constitution are most subject to it.

*Treatment.*—The treatment of the stye, in its commencement, consists in endeavoring to remove the inflammation

by resolution, by cooling saline lotions and purgatives. Linen cloths moistened with cold water or oxyerat, or poultices of ice, frequently applied to the eye, will often prove speedily beneficial. If these cannot remove it by resolution, suppuration of the swelling is to be promoted by means of emollient poultices. It is often slow in suppurating, and seldom requires to be punctured by a lancet, except when it is large and contains a slough. An incision is then required to promote its evacuation and hasten the cure. This treatment, along with some purgative medicine, is generally sufficient to remove the disease.

The recurrence of this affection is to be prevented by attention to the state of the constitution, sea bathing, warm clothing, and the application to the eye-lids of gentle stimulants, such as a weak citrine ointment, and a solution of sulphate of zinc, etc.

*Syeosis, affecting the edges of the Eye-Lids.*—To some this may seem a very trifling disease; but to the patient, extremely desirous to get rid of it, and to the surgeon, who finds it exceedingly difficult to disperse it, its apparent insignificance affords but little consolation. Other hard tubercles of the same kind are generally present on the face, but the one which is situated on the edge of the lid, or so close to either punctum as almost to surround it, shows a still greater tendency to resist treatment than any of the rest. On the edge of the lid, the tubercle, sometimes shoots out with a sharp edge, which may be nipped off with scissors. A regulated diet, the use of laxatives and antacids, daily touching with sulphate of copper, and warm fomentations, make up the treatment.

*Warts on the Eye-Lids.*—The eye-lids are frequently affected with warts. These, in young subjects, admit of

removal by escharotics. In others, they may be removed by escharotics, by incision, or, when pendulous, with narrow necks, by ligature. McKenzie recommends keeping the excrecence constantly covered with a piece of lint saturated with decoction of tormentil root; or a solution of carbonate of soda will sometimes serve for its removal. But, if this does not succeed, the wart may be tied with a wax silk thread, close to its root; or, if it has a broad attachment, destroyed by the application of lunar caustic. The shortest way is to nip off the excrecence with scissors. In elderly persons they sometimes degenerate into cancerous sores, so that they are often the beginning of what has been denominated cancers of the eye.

#### ECTROPIUM—AN EVERSION OF THE EYE-LID.

The signs of this affection are, a shortness and eversion of turning outward of the eye-lid, so that the internal red part projects externally, occasioning a disagreeable appearance, and partially denuding the eye. The disease may happen to either eye-lid, but is more frequently observed in the lower.

The causes assigned for this disease are various. First, a careless and improper handling of the eyes of the infant by the midwife. Secondly, a laxity of the internal membrane of the eye-lid, brought on by a long continued use of emollients. Thirdly, a weakness or relaxation of the orbicular muscle, as in old people. Fourthly, fungous flesh sprouting up in ulcers of the internal membrane, or after violent or frequent inflammations of the eye or eye-lids. Fifthly, a cicatrix succeeding a wound, ulcer or burn. Sixthly, a separation of the tarsi, at the great

canthus, in the operation for the fistula laehrymalis, or from the succeeding suppuration when the incision has been made too near the commissure of the eye-lids. Seventhly, a marginal dissolution, when by a wound or ulcer the tarsus is divided, from whence the angles of the fissure are retracted, and turned back into a bisid point either inward or outward. For the first species, authors mention no cure. The second we are to endeavor to remedy by a long use of strengtheners, astringents and desieants. In the third species, if any relief is to be expeeted, it must be obtained also by strengthening, drying, spirituous remedies; such as a dry heat; spirituous force used in vapor; the elay of warm baths. Kennedy mentions rags dipped in warm claret and honeye as among the remedies proper to be tried in this ease. Celus advises the application of the aetual cautery externally, which should be done with great eireumspeetion. With regard to the fourth cause, if a tumor has grown out upon the inner side of the eye-lid, it is to be cured by proper topieal remedies, or it is to be taken away by causties, or by an artifcial excision. If fungus has arisen, after having dispersed any inflammation there may happen to be by proper medicaments, it is to be carefully touched every now and then with the lapis infernalis, taking great eare to defend the eye by anointing it with axunge or ointment of tutty, and inserting a piece of bladder between the eye and eye-lid; and thus it is to be gradually consumed, until the eye-lid restores itself by the elasticity of its tarsus; or it may be removed by the knife, previously passing a crooked needle or a ligature through its base, for the more eonvenient holding of it while performing the operation. The fifth, sixth and seventh must

be remedied by surgical operations. I will here take the opportunity to recommend to all who are anxious for a knowledge of operative surgery on the eye, G. J. Guthrie's Lecture on this subject,\* and Walton's Operative Ophthalmic Surgery, of which I have already made mention. This work has been republished in this country, edited by Dr. Littell.

Amongst other diseases to which the eye-lids are subject, and which can only be cured by operation, I would mention

#### LAGOPHTHALMUS—THE HARE'S EYE.

The hare's eye is a gaping of the eye-lids produced by a retraction, or natural shortness of one or the other of them, by which it happens that its motion becomes confined, and it does not cover the eye during the time of sleep. The cornea, by being thus continually exposed, at first becomes dry, and then loses its transparency. This is mentioned by almost all writers as a disease of the superior eye-lid, but some assert that they have seen it in the lower.

As causes of this deformity, we may enumerate the following: not unfrequently a spasm of the levator palpeb. super., or a relaxation of the eye-lid; often, also, ill cicatrized wounds, or ulcers of the integuments of the eye, accompanied with loss of substance. In rare cases a short eye-lid is congenital. The prognosis is often favorable, particularly when no organic disease has induced the affection. When, however, the shortening has arisen after considerable loss of substance of the pal-

\* Lectures on the Operative Surgery of the Eye, by G. J. Guthrie, F. R. S.

pebra, as the eye is exposed to all external injuries, ophthalmia, opacity, and dryness of the cornea may result. But if the shortening be inconsiderable, the prognosis, at least in regard to the functions of the eye, will be much more favorable, because in this case the eye-ball will be but partially uncovered.

In regard to the cure, spasm must be removed by anti-spasmodic means, and if relaxation has been the cause, it is to be treated by topical stimuli and tonics, during which, however, the general diseases from which the spasm and relaxation have sprung are on no account to be overlooked. If cicatrices of the integuments of the eye-lid have been the cause, then, as in ectropium, an incision of the eye-lid, and mechanical extension of the wound till healed, have been recommended, but a favorable issue has seldom been found.

Dr. Monteath states that he has frequently met with lagophthalmus occasioned by temporary palsy of one-half of the face, produced by exposure to a current of air. I have seen this disease continue from two weeks to twelve months, during all which time the eye could not be closed on account of the paralysis of the orbicular palpebrarum. I have accurately noted a number of these cases, and feel convinced that cold is the invariable cause, producing at first an inflammatory state of the pes Anserinus, and, perhaps, in some cases, an inflammatory swelling, and diminution of the calibre of the aquæ ductus Fallopii, causing consequent pressure upon the trunk of the nerve. Pain radiates from the ear along all the branches of the nerve for some days; it then ceases, and perfect semi-facial palsy follows. This disease is soonest overcome by antiphlogistic treatment for the first few days, then

by applying a semi-lunar shaped blister around the ear, and rubbing the paralyzed parts with stimulating liniments.

#### PROLAPSUS OF THE UPPER EYE-LID—BLEPHAROPTOSIS.

This disease is produced, first by a relaxation and extension of the common integuments of the upper eye-lid, and consequent folds of the skin, by which the energy of the levator palpebræ superioris is somewhat diminished. The patient, in this state, cannot elevate the eye-lid, at least not properly; it hangs over the cornea; yet the efforts of the levator may be seen if the patient in the first place opens the eye-lid. If the superfluous skin which causes the ptosis be pinched between the fingers, without, however, dragging it, the patient can open the eye-lids, because the oppression of the superfluous folds of skin no longer prevents the levator palpebræ from performing its function.

The best cure is that of operation, which consists in removing the folds of skin and stitching the wound. In the more slight cases of blepharoptosis the following liniments have been highly spoken of, and I have known great benefit derived from them :

- Rx Mary syriaci, ʒ iv.
- Sp. vin. rectif., ℔iv ft. tinctura, adde.
- Saponis duri., ℥i.
- Camphor, ʒ iv.
- Sp. camphor, ʒ v.

To be rubbed gently over the eye-lid, and the part above it next the eye-brow, several times a day.

- Rx Olei laur., 5 ij.
- Ol. Mac exprim, ʒ iss.
- Ol. Caraphyll, ʒ i.
- Bals. Peruvian, 5 ij. M.

To be used as the one above.

**INVERSION OF THE CILIA, TRICHIASIS, TRICHOSIS, AND DOUBLE ROW OF EYE-LASHES, DISTICHIASIS, PHALANGOSIS.**

That disease which consists in a more or less irregular direction of the eye-lashes towards the bulb, is called trichiasis. This fault of the ciliae, occurring most frequently in the lower eye-lid, either extends over all the ciliae, (which, however, seldom happens, unless when trichiasis is the consequence of entropium,) or there are only some of the lashes turned in upon the eye-ball, in which case the diagnosis is not always easy. The effect of the inversion of the ciliae is constant irritation upon the anterior surface of the eye-ball, from which result, not unfrequently, laehrymation, pains with inflammation, formation of pannus, specks, and ulcerations of the cornea.

When, besides the regular row of ciliae, there exists a more or less perfect row of pseudo-ciliae, which is turned in upon and irritates the eye-ball, the disease is called distichiasis phalangosis. The deviation of the regular ciliae, in which some of them are bent forward and others backward, thus forming, as it were, a double row, has also had the above name applied to it. The first kind, or proper distichiasis, occurs sometimes with the hairs growing from the conjunctiva bulbi, and other structures of the eye; but it is rarely met with, so that many celebrated surgeons, as Scarpa and others, have never seen it and doubt its existence. Others, again, including Demours and Beer, state that they have seen it many times.

Besides entropium, which is always accompanied with trichiasis, the latter disease has many other causes. Neglected serofulous inflammations of the glands of the cyc-

lids, psorophthalmiae and such like, which are accompanied with excoriations and ulcers of the edges of the eye-lid, are particularly apt to induce this disease. In such cases the edges of the eye-lids become callous, cicatrized, and greatly misshapen; the ciliae are consequently thrown from their natural direction and not unfrequently obliged to grow at the inner margin of the edge of the eye-lid. Sometimes, however, the bulbs of the edge of the eye-lid have grown properly, and the ciliae only have become curved towards the bulb; this may happen in pure inflammation of the glands of the eye-lid, in which there are no excoriations, ulcers and cicatrices, if the patient lies constantly on his face, with the ciliae glued and crusted together.

The prognosis in trichiasis is favorable when the cause does not consist in any deranged form of the edge of the eye-lid. If caused, however, by such a vitiation, a radical cure will rarely be effected. The cure is performed by gradually and frequently (in order to prevent too strong an irritation, from three to four only of the ciliae are to be extracted daily,) and frequently tearing out the faulty ciliae by means of hair forceps, with which the ciliae are laid hold of as near to the edge of the eye lids as possible, and then quickly extracted in a straight direction. If the direction of the bulbs of the ciliae be regular, (which is generally the case when there are no disorganizations present in consequence of cicatrices, etc.,) the ciliae, which soon grow, will resume their regular form. In all other cases the extraction is only a palliative measure, but may sometimes become a radical cure, when the extraction is diligently persevered in. *Calisens, Rowley, Beer* and others have seen the reproduc-

tion of the ciliæ and pseudo-ciliæ cease, particularly in young people. The trichiasis which accompanies ectropium can only be removed by curing the latter affection. *Celsus* directs the destroying of the roots of the hairs by the actual cautery. *Aegineta* also says that if the hairs be first plucked out with forceps, and the actual cautery applied afterwards, the skin will become more compact and no new hairs will grow out. Great care must be taken to guard the pupil of the eye from the application of the cautery or acrid medicaments.

Dr. Jager, of Vienna, has proposed the following operation for the removal of complete trichiasis, caused by disorganization of the edge of the eye-lid, and it has been performed by him, and by others since then, with very favorable results. He fixes with forceps the external part of the edge of the eye-lid near to the external canthus, and then with a knife formed for that purpose (for which, however, a good scalpel can be substituted) cuts away the external margin of the eye-lid which contains the root of the ciliæ, commencing at the temporal angle. The incision must be so conducted as to reach, but not to wound the tarsus.

### SECTION III.

#### GRANULAR CONJUNCTIVA.

It now and then happens, from continued or chronic inflammation, that the smooth surface of the conjunctiva lining the lids is raised into lobes or granules, and at the same time preternaturally reddened. This state of the

granular conjunctiva is occasioned by chronic irregular thickening of the membrane, and organization of adhesive matter poured by previous inflammatory action into the cellular tissue beneath, the membrane itself remaining entire, without the slightest abrasion of its surface. A granular lid, therefore, is not a granulating lid. Granular is simply a term applied to that peculiar appearance on the surface produced by unequal and unnatural distention from inflammatory effusion in subjacent parts. The term "granulating" would, of course, imply a denuded or raw surface secreting granulations. The granular projections, when first formed, are soft, and bleed readily under pressure; when of long standing, they become firm, hard, and less vascular. Now, as it affects the lid only, this complaint might appear to be a disorder of trivial importance, one which could never endanger sight. But a most severe and formidable disease, in more important structures, is the consequence of the long continuance of this apparently harmless one; hence, a knowledge of the proper treatment of it is essential.

The part which suffers first from the effects of granular lids is the transparent cornea. This tunic, from the constant friction of the irregular surface, becomes inflamed, opaque and vascular; and if the source of irritation is allowed to continue, it becomes abraded and disorganized, and thus total destruction of vision is the ultimate result.

A nebulous or diseased cornea, then, is a frequent consequence of granular lids; and a neglected case of this kind occasionally terminates in blindness. Now the effects of the pressure of granular lids on the transparent cornea are sometimes erroneously attributed to other

causes; and, therefore, lest you should fall into this error, I advise you in all cases of diseased cornea to pay particular attention to the condition of the palpebral conjunctiva, especially that of the upper lid. For the peculiar disease of the transparent tunic first shows itself on the upper part of the cornea, to which the upper lid corresponds: a plexus of red conjunctival vessels, passing down from the circumference of the globe, overshooting the margin of the cornea, and sending extremely minute branches to vesicles which form on that tunic, in a little while burst, and leave a scabrous appearance behind.

After a very short time a haze appears; showing that the inflammation on the surface of the cornea is extending to its deeper layers: a more opaque haze succeeds and spreads widely, the greatest degree of opacity still residing in the upper part. The whole cornea eventually becomes uniformly opaque and white, and surrounding structures partake in the morbid action.

Remember, then, that in all cases of granular lids, you have to look for the worst effects of the disease on the upper part of the transparent cornea; and again in every case of superficial inflammation of the cornea, if the appearances I have described are met with, you may rest assured that they owe their existence to the mechanical pressure of the eye-lid.

*Treatment.*—If active conjunctival inflammation is combined with a granular state of the lids, you may resort to leeching, cupping and purging, placing the patient at the same time on low diet, and freely scarifying the lids.

When inflammation is not active, and the affection has been of long continuance, counter-irritation will be found useful. This may be effected by the application either of

blisters, an issue, or seton, to a neighboring part; but the general health of the patient must at the same time be attended to. It will be necessary, in addition to frequent scarifications, if the granulations are hard and in a chronic state, to excite the morbid textures to healthy action, and promote absorption of the granulating deposit by astringents. In some cases we find it necessary to excise the indurated granules with curved scissors.

The best astringents I have found are the liquor plumbi diaeetatis, applied pure, and a solution of argenti nitratas, in the proportion of a drachm to half an ounce of water. In very obstinate cases, you may apply pure nitrate of silver to the granules with good effect; taking care, in using it, not to stain the conjunctiva of the globe, which you may avoid by the following precautions: in applying the argenti nitratas, or any other astringent, (fluid, solid, or unctuous,) to a diseased eye-lid, first evert the lid, and hold it free from the globe; dry its conjunctival surface with a piece of linen, and immediately make the application. Directly afterwards, dry it again, and apply some mild unirritating ointment; wipe this off and apply the ointment once more. You may then be almost certain that, whatever astringent has been applied to the conjunctiva of the lid, that of the globe will be left untouched; the desirableness of which must be obvious when the effect of strong local applications upon the surface of a healthy membrane is considered. The various forms of astringent collyria already mentioned, may be used with advantage in cases of granular lids. I generally prefer collyria to ointments, but both are useful if properly applied, especially the mercurial ointment, and

one formed of two drachms of nitrate of silver to half an ounce of unguentum ectacei.

Mr. France, in a note, remarks : "Some little explanatory allusion to the rationale of granular conjunctiva, seems desirable in this place. To understand fully this peculiar morbid condition, the structural anatomy of the affected membrane in a state of health, must be borne in mind. Now, it seems quite established by microscopical observation that the palpebral conjunctiva is possessed of a papillary surface, though the function of the papillæ is not clear. Taking this fact in connection with the remarkable proneness of the same portion of the membrane to exhibit the granular condition, (and that too at an early stage of inflammation,) and with the character of the individual granules, the conclusion can scarcely be avoided, that granular conjunctiva consists, in many instances at least, in morbid development, or hypertrophy, of the natural papillary structure of the membrane. Such hypertrophy doubtless is produced at first essentially by vascular congestion, and subsequently by interstitial fibrinous exudation ; so that the description of the text comprehends, in the main, a true representation of the pathology of this morbid change, even upon the theory just recited. But many incipient cases of granular lid, wherin the nascent granules are firm, broad-based, sessile, and so little numerous that they might almost be counted with the naked eye, cannot, without difficulty, be referred to hypertrophy of papillæ spread like the pile of velvet over the free surface of the conjunctiva ; and, though, perhaps, they might be attributed to inflammatory enlargement of the follicles, (of which Valentin is singular among microscopists in denying the existence,) "

are yet much more easily reconciled with the simple views of the author."

Dr. J. Hays, of Philadelphia, in a note to the edition of Lawrence's Work on the Eye, edited by this excellent oculist, very justly remarks: "The morbid condition of the palpebral conjunctiva, termed granular lids, is a most troublesome affection—extremely obstinate; subject to sudden and violent exacerbation from the slightest causes, and, therefore, demanding the incessant attention of the practitioner; and when allowed to continue, tending surely to the impairment, and most generally, indeed, to the total destruction of vision. A very large proportion of the applicants for admission into Wills Hospital labor under this disease; and the treatment which they represent themselves to have undergone, as well as the statements of private patients, leads us to infer that physicians generally are not as well acquainted with the complaint as it is desirable they should be."

Lawrence, after describing the disease, says: "In the selection and mode of application of local remedies to these granulations, great judgment and care are required. When the granulations are very vascular and spongy, scarifications will be beneficial. Of the local applications, the sulphate of copper is the one which is most generally found advantageous. In some cases this is not sufficiently active, and then the nitrate of silver, or the dilute nitric acid may be employed.

"Two years ago we were led, by the favorable reports of the efficacy of iodide of zinc in reducing enlargement of the tonsils, to try this application in a case of greatly thickened conjunctiva of long standing, which had proved rebellious to various remedies. The result was so satis-

factory that we have since employed it in a few similar cases, and our experience thus far authorizes us to recommend this remedy to the attention of the profession.

"In making these applications, the lids must be everted, and a basin of tepid water and a very soft sponge should be within the surgeon's reach.

"The first effect of the sulphate of copper and the nitrate of silver is to produce a puffiness of the lids with increased lachrymation, and some burning, which subsides in a few hours, and a purulent discharge takes place. In some cases, the symptoms just indicated become excessive and persist for several days, arising either from the remedy having been too freely applied, or to the wrong one being selected, and a change must consequently be made either in the remedy or the freedom of applying it. A common error is the too frequent repetition of local applications. The sulphate of copper should not be used oftener than once in two, three, or four days, the nitrate of silver and nitric acid (in substance,) only once in four, five or six days.

"When the eye is very irritable, with injection of the ocular conjunctiva and lachrymation, the most prompt and marked relief is afforded by a cold salt water bath to the eyes."

Dr. Hays, of Philadelphia, first called the attention of the profession to this remedy, some years ago, in a report of cases treated in Wills Hospital, and it has since been used by myself and others, whose experience confirms all that has been said of its remedial virtues.

## SECTION IV.

## OF AMAUROSIS.

UNDER the title of amaurosis are usually comprehended all imperfections of sight, whether arising from disease or disordered function of the sentient parts, or of those which are termed the cerebral and nervous parts of the apparatus of vision; even though such imperfections of sight arise from a great many different diseased states, both functional and organic, not of these parts merely, but of other parts of the body at a distance from them.

The term amaurosis, therefore, is commonly given to all imperfections of vision that arise from any disease which affects the functions of the retina. Amaurosis may affect one eye or both, and the derangement of function may extend over the whole of the retina, or only a small part of it may be affected. The functions of the retina may be affected by many diseased states, not of itself merely, and those parts with which it is connected, but of parts also which are remote from it.

Whether the seat of the disease which occasions amaurosis is in the brain, in the optic nerve, in the circulating system, in the digestive organs, in the retina itself, or in other parts of the eye, the amaurotic state is indicated by the increased or diminished sensibility of the retina to light; and the true nature of the disease is to be inferred from this in connection with other symptoms.

Amaurosis may be functional or organic, and each of these forms of it may be again divided into that which is idiopathic, and that which is symptomatic of some other disease.

The disorder is attended with a certain combination of symptoms, from whatever cause it may arise. In treating of this disease, therefore, these symptoms shall be first detailed, mentioning, at the same time, the circumstances attending them, which tend to point out the nature and cause of the amaurosis.

*Symptoms of Amaurosis.*—The most common symptoms of amaurosis are imperfect vision, consisting of partial or complete loss of sight, either permanent or temporary, pain in the eye or some other part of the head, dark spots, sparks, and flashes of light, or other imaginary objects appearing before the eye—called *muscæ volitantes*, or *ocular spectra*—accompanied with an irregular, dilated and commonly immovable pupil, which aperture in many cases loses its jet black appearance. These symptoms are modified in different cases by the nature of the cause of the amaurosis, which may occasion them to assume a considerable variety of appearances. This circumstance frequently renders the diagnosis a matter of difficulty, especially as several other diseases of the eye are attended with symptoms somewhat similar. With these diseases also amaurosis is frequently complicated. It is, therefore, of importance to be acquainted with the variety of appearances which the symptoms of amaurosis present in different cases, according to the cause of the disease.

1. *Impaired Vision.*—According as vision is imperfect or entirely lost, amaurosis is called perfect, or imperfect—partial or complete. The imperfect vision is in some cases temporary and periodical, in others it is permanent—the latter being the more common occurrence. When the blindness or imperfection of sight is temporary and periodical, it frequently takes place at regular inter-

vals, as at a particular time every day, or every month ; or, as sometimes happens in females, it takes place at a particular time during each period of pregnancy, and again goes off at the time of delivery. When the imperfection of vision is more permanent, it often varies at different times of the day ; in some cases the sight of the patient becomes habitually worse in the afternoon and better the next morning ; others see worse for an hour or two after rising. The degree of light at different times of the day, in some cases, has an effect on the sight ; some seeing best in a full bright light, others in a weak light, as after sunset. Some see well by candle-light, others do not. Some persons see only during the bright light of day, and become blind in the evening ; this is called Hœmeralopia, seeing by day, or night-blindness. Seeing in the dark, or by night, is called Nyetalopia, which is a much more rare occurrence. The eye having been for some time in a state of rest, as during sleep, in many cases, persons are enabled to see better on rising in the morning than at other times of the day. This shows that the disease is produced or aggravated by exerting the eyes. The state of the stomach, too, has a temporary effect upon the sight of some persons. When empty, along with faintness, there is dimness, indistinct vision, or *muscae volitantes*, in those who do not otherwise complain, which goes off after taking food. Amaurotic persons are easily affected from this cause. Dyspeptic and delicate persons, and those subject to sick-headache, often complain of dimness of sight.

These varieties in the state of vision in amaurotic persons are referable to the susceptibility of the retina to light ; the degree of it necessary for vision, the adaptation

of the pupil, and the quantity of light that is either absorbed or reflected within the eye. Impaired vision from amaurosis varies in different individuals, and in some cases at different times in the same individual, from a slight dimness or muddiness, as if every thing was seen through a mist, to the state of perfect blindness. Some patients affected with amaurosis, and in whom vision is only impaired, see objects, particularly small ones, very indistinctly, appearing as if they were enveloped in a cloud, so that they do not see their proper shape; others see objects imperfectly by seeing only a part of them, there being a partial insensibility of the retina. Some describe a horizontal, others a vertical screen, rendering one-half of the object viewed invisible, when the axis of the eye is directed to the object; so that they are obliged to move either the head or the eye in the direction necessary to cause the light admitted into the eye, to be directed to the sensible part of the retina.\* For the light in such cases is most commonly required to enter the eye in an oblique direction. In some cases, however, the lateral vision is impaired or lost, so that the patient sees only in the direct line of the axis of vision. Other persons affected with this disease can discern the shape of objects but cannot distinguish their proper colors; while to others colors appear different from what they really are. This arises from the retina being insensible to part of the rays of which light is composed. Some persons affected with this disease see objects multiplied, being doubled or tripled, a circumstance which is not easily accounted for. In some, objects appear distorted—bent, lengthened, or shortened.

\* See my work on Glasses, why and when to use them.

In those persons who can discern only a part of an object, there is reason to believe that only a part of the retina is sound. When that portion of the retina with which the patient sees is not opposite to the axis of vision, he seems to squint in looking at an object. For vision depends on the situation as well as the extent of the part of the retina which is affected.

2. *Pain.*—Amaurosis very often begins with pain in the eye or some part of the head. This is a very frequent symptom, attending the disease in all its stages and degrees. It is generally situated in the forehead or in the eye. In some cases, however, there is no pain, but great heat is felt in the eyes.

Pain, at the commencement of amaurosis, affecting the forehead, temples, or eye-balls, often diminishes in proportion as the sight becomes impaired; and when the vision has become extinct, and the amaurosis perfect, the pain usually ceases altogether, when the disease is seated in the eye-ball. The pain in many cases is not constant, but comes and goes, and is various in its degrees at different times. In some cases, it assumes an intermitting character, increasing and becoming more severe towards the evening, every day or every second day, and continuing for several hours. In many cases, instead of pain, there are only disagreeable and painful sensations felt about the eye-ball, or there is a sense of fullness in the forehead and eyes, along with increased heat and flushing of the face.

The pain accompanying amaurosis is not always an indication of inflammatory action going on, nor can it always be referred to a plethoric state or fullness of blood in the parts; for it sometimes occurs when the amaurosis

seems to depend neither on inflammation nor plethora in the head or eye, and even when there are symptoms of an opposite state. When the pain and vision are worse after taking food, it is obvious that the stimulus and excitation produced thereby have a hurtful influence; which shows that the disease is either of a plethoric origin or of an organic nature. When, on the other hand, the disease is worse before taking food, debility or languid action is probably the cause of it.

The pain is sometimes referred to the situation of the supra-orbital, infra-orbital, or other nerves about the eye, and, in some of these cases, the affection resembles the disease called *tic douloureux*, affecting the fifth pair of nerves.

By the situation and degree of the pain, and its association with other symptoms, an opinion may be formed, with some degree of accuracy, as to whether the disease is organic or only functional. In the most common forms of functional amaurosis the pain is at times inconsiderable, and declines as the dimness of sight increases. In the organic amaurosis the pain is usually severe, constant or without any complete intermission, and is commonly increased by any cause of excitement.

The existence of organic disease is rendered more certain, when there exist, accompanying the amaurosis, other symptoms of cerebral disease, such as stupor, paralysis, or torpor of the system.

3. *Muscae Volitantes, or Ocular Spectra.*—(*Visus Muscarum Myodesopsia.*)—Persons affected with amaurosis generally think that they see before them objects which in reality have no existence. These phenomena have been termed *ocular spectra*, or *museæ volitantes*. They pre-

sent different and varied appearances in different persons, and also at different times in the same person. They have commonly the appearance of certain known objects, at rest or in motion. In some they all seem to be black, in others to have different bright colors. Sometimes they have the appearance of black motes or gnats and flies, flying about, or streaks and net-work. Very often bright shining, or luminous objects are seen, which present different appearances, as balls of fire, flames, bright flashes of light, sparks, rays of light, or falling stars. In some, a luminous spot appears, which forms a circle that gradually expands and vanishes. In some cases there is a black spot of this kind.

In many cases these appearances are very transitory; in some they come on only at regular intervals; in others they are fixed and permanent. When ocular spectra are transitory, they generally vary in their appearance at different times, and seem to float before the eye, assuming diverse fantastic forms. Sometimes this symptom assumes the form of a single black mote, resembling an insect moving before the eye; sometimes two or three appear, and at other times, an immense number seem to be present.

In many cases the *muscae volitantes* are the only symptom of amaurosis that exists. When this symptom is constant, and when the spectrum remains the same, without changing its form or situation, except to increase, there is reason to believe that it is a symptom of organic disease; the floating or moving spectra being commonly symptomatic of functional amaurosis. The fixed spectra pointing out the part of the retina which is diseased —the floating *muscae volitantes*, disordered circulation.

In functional amaurosis muscae volitantes occur in two distinct and opposite states ; the one increased excitement, the other of collapse.

4. *State of the Pupil.*—The state of the pupil which indicates the mobility and activity of the iris is one of the surest indications, when taken in connection with other circumstances, of the healthy or diseased state of the retina. In an eye affected with amaurosis, the pupil is in general more dilated than when not diseased, and is frequently of an irregular shape, having lost its natural circular form. Its contraction, upon the sudden admission of light is either slow or incomplete, or both. In some it moves more quickly than is natural, owing to increased susceptibility of the retina to light ; and in others it is more contracted than when free from disease.

The state of the pupil will often point out which eye is affected, even though the disease be very slight. When the retina is quite insensible, the pupil is generally dilated, motionless, and often irregular ; but in some cases of perfect amaurosis, the iris retains its mobility. This state of the pupil may arise from the condition of the iris and ciliary nerves, independently of disease of the optic nerve or retina.

The color of the pupil is frequently changed in cases of amaurosis. Instead of its natural black or dark green color, in some cases, it has a clouded, a muddy amber, or a yellowish green color. Some of these particular states are called glaucoma. In some cases, when the pupil is dilated, a yellowish white or green color is observable in the bottom of the eye, having also red vessels ramified upon it. This may be caused by the retina having become opaque from a deposition of lymph upon it, from

previous inflammation, or by morbid growth or tumor. The opaque appearance of the pupil occasionally gives rise to some difficulty in distinguishing amaurosis from opacity of the humors of the eye, particularly that of the crystalline lens, or cataract. How a correct diagnosis may be formed between these two diseases, will be pointed out when treating of cataract.

*Causes of Amaurosis.*—Whether idiopathic or symptomatic, it arises from many different causes, and is also sometimes congenital. It affects persons of all ages and circumstances, and may take place in one eye, or both may be affected, according to the nature of the cause by which it is produced. It may take place suddenly, or come on slowly and gradually, affecting one eye at first, and then the other, or both at the same time. It affects only one when it arises from a local cause; but when the cause is constitutional, both are generally affected. Amaurosis varies in degree in the progress of different cases. It may gradually diminish till the patient recovers. But when it continues or grows worse, imperfect amaurosis may become perfect—and that which was at first functional may become organic.

In some cases, amaurosis is accompanied with inflammatory symptoms, such as increased force in the circulation, indicated by quick, full pulse, pain in the head or eye, increased determination of blood to these parts, giving rise to flushing of face, increased heat, lethargy, and tinnitus aurium. In others it is accompanied with symptoms of dyspepsia, or derangement of the digestive functions, indicated by sickness, loss of appetite, headache, foulness of tongue and irregularity of the bowels. These states are very frequent causes of functional amaurosis.

When amaurosis is accompanied with derangement of either the circulating or digestive system, and is not occasioned by organic disease, this derangement is generally the cause of it. Removing or curing the disorder of the circulating or digestive system, therefore, very frequently cures the disease. But great care is necessary to prevent its recurrence.

Functional amaurosis is likewise frequently caused by over-exertion or excitement of the eye, and goes off when the organ is allowed to rest. A plethoric state of the system—debility from great and sudden evaenations—narcotic and other deleterious substances—pressure upon the brain, either from depression of a portion of the skull, or from extravasation of fluid, often produce this affection. Pressure upon the optic nerve or retina, as by a tumor within the orbit or cranium, also produces functional amaurosis.

Organic amaurosis is frequently occasioned by external injury, when either the optic nerve or retina is wounded and detached from its connections. The retina may also be pressed upon or detached from the other coats of the eye by effusion of blood. Change in the texture of the retina from inflammation of it—enlargement or wasting of the eye—and tumors or suppuration connected with the optic nerve or retina, are also frequent causes of organic amaurosis.

Amaurosis may also arise from organic affections of the brain, such as apoplexy from congestion or extravasation of blood—hydrocephalus,—abscesses or tumors of the brain.. In these cases it is a symptomatic affection.

In consequence of the peculiar connection that exists between the fifth pair and the visual nerves, amaurosis

has often been observed to arise from injury or disease of the branches of the fifth pair. Some of these cases have been cured by the division of the nerve or the removal of the source of irritation.

*Diagnosis.*—The full account which I have given of the symptoms of amaurosis, and the allusions made regarding the connection between these symptoms and the causes which give rise to the disease, leave but little to be said upon the subject of diagnosis. In organic amaurosis, the state of vision seldom varies, but continues much in the same state. In functional amaurosis it varies considerably at different times, and in particular states of the system.

Organic amaurosis is often known to exist from particular combinations of the symptoms attending it, as well as from the cause by which it has been occasioned. When marks of disorganization of the globe exist, such as general enlargement of the eye-ball—staphyloma of the sclerotic coat—atrophy from absorption or evacuation of the humors—opacity of the vitreous humor,—pupil much dilated, contracting very little or remaining stationary,—insensibility of the eye to light,—superficial varicose vessels upon the sclerotic coat—or an opaque appearance in the situation of the retina, along with muscae volitantes, whether transitory or permanent, the amaurosis is generally organic.

Cases of amaurosis are often complicated with other diseases of the eye, such as cataract, permanent contraction, or closure of the pupil, disorganization of the vitreous humor, etc.

*Treatment of Amaurosis.*—The proper treatment of amaurosis consists in the employment of such remedies

only as are suited to the nature of the disease, and to the removal of the cause from which it arises. It is functional amaurosis alone, whether idiopathic or symptomatic, that offers encouragement for remedial treatment. When early applied, the disease may in general be cured; but when it has existed for any considerable length of time, it may have become organic, and in all probability incurable.

The remedies which are beneficial in cases of amaurosis are few in number, consisting chiefly of the anti-phlogistic regimen, and those medicines which correct functional derangement in the digestive organs; and, in the more rare cases, when the disease arises from debility, remedies of a tonic and stimulating character.

When amaurosis arises from inflammation, determination of blood to the head, or suppression of an habitual evacuation, the treatment consists in diminishing the quantity of blood sent to the head and to the eye. The same remedies, therefore, apply to this that are recommended for acute inflammation of the eye. These consist of bleeding, blisters, nauseating and purgative medicines, as in case of ophthalmia, applied according to circumstances, along with spare diet and restoration of any suppressed evacuation. Removing the hair, and the frequent application of cold water to the head, or shower bath, are also of great importance.

When amaurosis arises from dyspepsia or derangement of the digestive organs, these conditions being corrected, the cure of the amaurotic affection will follow. Such cases are to be treated upon general medical principles, and the treatment persevered in for a considerable length of time. I have usually found magnesia and rhubarb,

with aloetic or compound colocynth pill alone, or combined with either a small quantity of ealomel or blue pill, to be highly beneficial and sufficient to accomplish the desired effect. In some cases, the blue pill, at night, with small doses of neutral salt next morning, is also useful.

When it arises from a state of general debility, tonics and nourishing diet, with an allowance of wine, are requisite. Stimulants, as the vapor of ammonia,\* applied to the eye are also of use. In such cases, and when the disease arises from the eye having been over-excited by too strong a light or too much exertion, bleeding is to be avoided as hurtful. Complete rest and tranquillity, both of mind and body, as well as of the eye, are of most consequence.

When amaurosis takes place in consequence of excessive determination of blood to the head or eyes, from too much excitement, the application of blisters and issuing upon the temples or back of the neck, along with mercurial and purgative medicines, is best suited to arrest the disease. Along with these remedies the mind and the eyes must be kept as much as possible in a state of tranquillity and rest. The patient should neither read nor write, nor work at any kind of employment requiring much exertion of the visual organs.

Moderation in diet, and temperance, along with daily use of the shower bath, or cold otherwise applied to the head, ought to be strictly enjoined, together with exercise in the open air. The occasional detraction of blood, particularly by cupping the temples, behind the ears, or between the shoulders, is also of great use.

\* See Repertorium for Internal and External Remedies recommended in amaurosis.

## SECTION V.

## CATARACT.

CATARACT is an opacity of the crystalline lens. Whenever the crystalline lens or its capsule, instead of preserving the transparency natural to them, becomes opaque, the affection is called cataract, which may therefore be defined an opacity of the lens, or of its capsule, or of both. The existence of cataract is known by opacity, in greater or less degree, immediately behind the pupil. The morbid change may occur as an idiopathic disease, as the effect of inflammation propagated from surrounding parts, or as a consequence of mechanical injury, wounds, etc. The cause of idiopathic cataract is not known ; it occurs at all ages, and in all constitutions, and is usually rather slow in its progress. It is generally found in both eyes of the same person, the two cataracts being sometimes formed at the same time, but more frequently in succession. When the affection arises from inflammatory action, or is caused by mechanical injury, it is more rapid in its progress, (a day or two being sometimes sufficient for its development.) But its existence in one eye need not necessarily lead to the expectation of its subsequent occurrence in the other.

At first, the sight is generally weakened, and distant objects are distinguished with difficulty. After a time nearer objects are rendered indistinct, and appear as if seen through a mist. In the early stage of the complaint, a central spot of opacity is now and then formed, which completely intercepts the rays of light when the pupil is closed, but is not large enough to obscure vision when

the pupil is dilated, and the rays are permitted to pass through the circumference of the lens. In these cases, consequently, the patient sees tolerably well in a darkened room, or with his back to the window, owing to the pupil being more dilated than when under the impression of a strong light, and the application of belladonna, of course, improves vision in the same way. When the change of structure has extended over the whole lens, a dilated pupil is of no assistance.

Cataracts have been described as of various colors—yellow, blue, brown, black, pearl, iron, silver, or milky color, speckled, striated, barred, etc. Of these, as two great outlines, the pearl-colored, yellow and brown may be considered as indicating a hard cataract; while the white, milky, or striated rather point out a soft cataract; but the milky color of a cataract is by no means a test of its solidity; many perfectly white, and supposed to be soft, having, after extraction, been discovered to be hard; and the pearl-colored, on the contrary, have been found to be soft. Neither does the color after extraction always correspond with the color observed before the operation, being sometimes much darker. As to the *nature* of cataracts, the size is a much surer indication than the color; it having been found that the smaller the lens and the darker the color, the more solid was its substance, except, perhaps, where there appears to have been some defect of organization or growth from early life; in which case, a soft, bluish white cataract, with a striated capsule, will often be observed when the pupil is fully dilated, seated on the vitreous humor, and surrounded by a black transparent ring, the consequence of the deficiency of size of the lens and its capsule. The larger and more protuber-

rant the lens, pressing forward even to the pupil and against the iris, the greater is the certainty of its being soft.

Cataracts have been termed ripe and unripe, with reference to their consistence and the proper period for operation, but these terms are illusory. A cataract was said to be ripe when it had attained a degree of firmness sufficient to admit of its being depressed or extracted as a solid body. It was supposed to be in a state of maturity when it had a gray or pearly color, when the patient was only able to distinguish between light and darkness, or to see the shade of an object when placed between his eye and the light. When this could not be done, the cataract was presumed to have become old, adherent, and complicated. A cataract was supposed to be unripe when in a recent, or incipient, or soft state; when the patient could still see objects in a moderate light, and when it was presumed to be sufficiently firm to admit of depression, in which case it was generally found to be of a white color.

*Capsular Cataract.*—Opacity of the capsule is said to occur in spots or streaks, with less opaque intervals. It is not unfrequently the result of a slow inflammation, which may be accompanied with pain in the eye and indications of congestion in the head; it may be produced also by inflammation extending from the iris or conjunctiva. Opacity of the anterior portion may be seen immediately behind the iris, and has a glistening, chalky, or pearly white appearance. That of the posterior appears at some little distance behind the pupil, and presents a coneave striated surface, of a dull yellowish appearance. Capsulo-lenticular cataract is very common,

in fact opacity of the capsule is always followed by opacity of the lens.\*

Cataract must be removed by operation. No other treatment is of any avail in getting rid of the disease, although, perhaps, its progress may be retarded by the use of counter-irritants and stimulating applications to increase the flow of tears and sternutatories, and by such measures as will depress vascular action. It is, however, a general rule not to operate till cataract is mature—that is, not while the degree of vision is sufficient for ordinary purposes. Where the opacity is partial, as with the cornea, we frequently give our patient vision for a long period by dilating the pupil so as to unveil some part of the retina, thus rendering further operation unnecessary for years. The extract of belladonna is generally employed for this purpose, although I prefer in all cases to use a weak solution of *atropine*, of which *one grain to two or three drachms of water*, with a drop or two of *acetic acid*, will amply suffice. It is singular that this remedy never loses its power by use, and, therefore, may be continued for an indefinite period. Before operating, the patient should be put in as perfect a state of health as possible. The

\*It is not my intention to enter into all the details on the symptoms and appearances common to the various kinds of cataract, nor to dwell minutely on the diagnosis, prognosis, &c., for, as stated in the preface, in compiling this book I had but one view, that of placing in the hands of the student and the young practitioner a guide to those diseases to which the eye is most subject, and which require medical attention and treatment as soon as they make their appearance; because, slight as many of the diseases may be, if neglected or improperly treated, the vision often becomes seriously jeopardized, and sometimes permanently destroyed. To those who are desirous of becoming fully acquainted with Operative Ophthalmic Surgery, the author would strongly recommend, besides the works of Messrs. Walton and G. J. Guthrie, the invaluable "Treatise on Cataract and its Appropriate Treatment," by Charles G. Guthrie.

bowels should be cleared, and the secretions regulated. If the habit be inflammatory, blood should be taken and low diet enjoined. Moreover, the operation should always be performed in mild weather.

There are three methods for operating. I. For extraction. II. Depression (or couching.) III. The operation for causing absorption.

I. *Operation by Extraction.*—PRELIMINARIES.—The patient should be seated in a low chair with high back, opposite a window that admits a good clear light, but not sunshine, and the eye to be operated upon should be turned somewhat obliquely to the window, so that the operator may not see the image of it on the cornea. The surgeon should sit immediately before the patient on a higher chair, and should have a stool, so as to raise one knee to a proper height for steadyng the elbow of the operating hand upon it. Behind the patient an assistant should stand, whose duties are to steady the head against the back of the chair, or against his own breast, to elevate the upper eye-lid and fix it against the margin of the orbit with one forefinger, and to drop it at a preconceerted signal from the surgeon.

OPERATION.—1st. The surgeon depresses the lower eye-lid, and steadies the globe with the fore and middle fingers of one hand, but without exerting any pressure on it. He particularly endeavors to prevent it from rolling inward during the operation.

2dly. Holding the cornea knife (the knife called Beer's is most used) like a pen, (in the right hand for the left eye, and *vice versa,*) and resting the other fingers on the patient's cheek, he touches the cornea once or twice with the flat part of the blade, to allay the patient's alarm.

3dly. He punctures the cornea close to its outer margin, pushing the point of the blade perpendicularly towards the iris, and not obliquely; otherwise it would pass between the laminae of the cornea instead of entering the anterior chamber.

4thly. He must push it steadily across parallel to the iris, till it cuts its way out, making a semicircular flap of the lower half of the cornea, upon which the eye-lid should be immediately dropped.

5thly. Waiting a few seconds, the surgeon takes a eurette,—introduces the pointed end with the convexity upward, and freely lacerates the capsule with it,—and then withdraws it with the convexity downward.

5thly. He gently presses on the under part of the globe, and on the upper eye-lid till the lens rises through the pupil and escapes.

Lastly, the eye should be opened after a minute or two, to see that the flap of the cornea is rightly adjusted, and that the iris is not prolapsed:—if it is, the eyes should be exposed to a bright light, so as to make the pupil contract, and the prolapsed portion gently pressed upon with the spoon of the eurette. Then the operation is finished.

It follows, as a matter of necessity, that there must be many variations in the mode of performing an operation comprising so many minute and delicate manœuvres as the one under consideration. Thus, if the surgeon be an ambidexter, he may sit before the patient, when operating on either eye, but if he can use his right hand only, he must sit behind his patient when operating on the right eye. Many surgeons make a flap on the upper half of the cornea, instead of the lower half. The advantages of this operation, says Mr. *Lawrence*, are that the oper-

ator has more complete control over the globe; he can fix it very perfectly; that the aqueous humor does not escape so readily, and consequently that the section of the cornea is more readily accomplished; that there is less chance of prolapsus iridis; and that the upper lid keeps the flap of the cornea in exact apposition. Some operators again dispense entirely with an assistant, and fix the globe with the left hand. Mr. *Guthrie* also objects to making the puncture of the cornea with the knife perpendicular to the eye. Some operators use belladonna to dilate the pupil; others are averse to it. I always use it and would recommend others to do so.

*After Treatment.*—The patient should be put to bed, with the shoulders raised, the room darkened, and with a very soft dry linen rag over both eyes. No food requiring mastication should be allowed, the bowels should be kept open, and every thing likely to provoke coughing, sneezing, or vomiting, avoided. If he gets on comfortably, the eye-lid may be raised on the fifth day, and then, if there be no prolapsoe of the iris, and the cornea has united, he may leave his bed occasionally, wearing a shade, sitting in a darkened room, and walking about a little. After a fortnight, the eye may be opened in a weak light, and gradually brought into use. But, inasmuch as it remains weak and irritable, the patient must take the greatest care to avoid exposure to cold, excess in diet, over exertion of the eye, and to guard against the wind, or too glaring a light.

The inflammation which may come on after the operation may be of two kinds. If the eye-lids are swollen, florid, and tender, and there is a thick yellow secretion about the lids, the conjunctiva being red, swollen and

chemosed, the inflammation is acute and requires to be treated by bleeding and purging. But if, according to Mr. Tyrell, the palpebral are not much discolored, and rather oedematous than tinged with blood; and if the secretion is light-colored and the conjunctiva oedematous, the patient will be benefited by good broth, carbonate of ammonia and opium.

*II. Depression, or Couching.*—The preparation of the patient, his position during the operation, as well as that of the surgeon, and the duties of the assistant, are the same as required for the operation of extraction. The pupil should be dilated with belladonna. There are four ways of operating.

1. A couching needle is passed through the outer side of the sclerotic, about two lines behind the margin of the cornea, and a little below the transverse diameter of the eye, so as to avoid the long ciliary artery. It is carried upward and forward behind the iris, and in front of the cataract, and is then steadily and gently pressed upon it till it has carried it downward and backward out of sight. It should be held for a few moments to fix it, then should be lifted up, and if the lens rise also, it must be again depressed for a short time. The needle is then withdrawn.

2. According to Scarpa's plan, a curved needle is used instead of a straight one. It is to be introduced with its convexity forward, and the lens depressed in the manner just described; but before withdrawing the needle, its point is to be turned forward and made to lacerate the capsule freely.

3. *King's Operation.*—A curved needle is passed perpendicularly through the sclerotic, as low down as possi-

ble, and if the patient's eye is directed upward and inward, it can be made to enter almost perpendicularly below the centre of the cornea, and one-eighth of an inch from its margin. It should then be passed onward with a slight rotary motion to the pupil, having its convexity forward, i. e., towards the back of the iris. When it reaches the pupil these rotations are to be increased, so that the point may cut the anterior capsule into small pieces. The needle is then slowly withdrawn, and the lens follows it, so that it is left at the bottom of the eye, close to the puncture made by the needle. If the lens should not immediately follow the needle downward, the latter is to be stuck into it again.

4. The method of reclination, which consists of turning the lens backward from an upright to an horizontal position, is not much in use, although some surgeons recline the cataract before they depress it.

**III. Absorption.**—The operation for producing absorption is very easily performed, and excites very little inflammation. Its disadvantages are, that it requires to be repeated several times, and that the cure is very slow, occupying several weeks or months. It is well adapted for soft cataract, especially congenital, but very seldom, if ever, answers with the hard cataracts of old people.

**OPERATION.**—1st. The needle may be introduced behind the iris, in the same manner as for depression. Then the anterior layer of the capsule is to be freely divided, and the needle, having been passed once or twice through the substance of the lens, is to be withdrawn. Care must be taken not to dislocate the lens in this operation. The cataract will be more or less dissolved by the aqueous humor, and become absorbed. After the lapse

of a few weeks, the operation may be repeated, the capsule may be lacerated more extensively, and the lens cut up into fragments, which, if perfectly soft, may be pushed through the pupil into the anterior chamber, where absorption is more brisk. This operation may be repeated again and again, if necessary. But if a hard fragment be pushed into the anterior chamber, it may probably excite great inflammation, and require to be removed by operation, so that the surgeon had better avoid attempting to do too much at once.

2d. There is another modification for this operation which Mr. Tyrrell terms the operation by drilling. It is particularly adapted for cases of capsular, or capsulo-lenticular cataract, which have been caused by extension of inflammation from the iris. It is performed by introducing a fine straight needle through the cornea, near its margin, and passing it through the pupil to the lens; it is then to be made to enter the substance of the lens to the depth of about one sixteenth of an inch, and to be freely rotated. This operation may be repeated at intervals of three, four, or five weeks; and if the puncture be made in a fresh place at each operation, that portion of the capsule which is behind the pupil will become loosened and detached, and the lens absorbed. This operation may also be occasionally resorted to in order to diminish the size of the lens, previous to depression or extraction.

*Congenital Cataract.*—Those who wish to become proficients in operating on infants, should avail themselves of the most important information contained in Mr. Saunders' Treatise on the Eye. I most earnestly recommend a diligent perusal of its contents, and particularly that part which treats on congenital cataract.

## SECTION VI.

## OPERATION FOR STAPHYLOMA.

I HAVE already, in Part II, Section III, spoken of staphyloma and its treatment, and I have only to remark here that if the complaint is inveterate, or does not yield to remedies, we must proceed to an operation for the removal of it.

A total staphyloma of the cornea can be removed only by an operation, and the method of Beer deserves the preference to any other. The happiest effects resulting from it have been observed by myself and others,—such as the removal of deformity and pain, and all other unpleasant symptoms, and the parts rendered fit for the insertion of an artificial eye. To perform this operation, one of Beers' cataract knives, but broader than usual, is to be thrust into the base of the staphyloma, at the external canthus, as in the operation of extraction, and is to be brought out again in the inner canthus, at the part exactly opposite, and the flap is to be completed merely by pushing on the knife in a horizontal direction, as directed in the operation for extraction. The assistant,—who holds up the superior eye-lid, during these steps, with the fore and middle finger only, or, when the staphyloma is very small and the patient very unruly, with Ruhter's silver wire hook,—must not allow the eye-lid to fall down after the completion of the first cut, for the operator is without delay to take hold of the flap of the staphyloma with a strong pair of forceps, and cut it completely away, by means of Daviel's scissors, but without pressing upon the eye, so as to avoid giving occasion for the loss of the lens.

and vitreous humor. The assistant is now to allow the upper eye-lid to fall, and the eye is not to be opened again till the cure is accomplished.

In the operation for conical staphyloma, the lens and vitreous humor can never be preserved, because in this case the incision is made behind the lens; the staphyloma must also, in this case, be laid hold of with a hook, at the commencement of the operation, which is then to be continued as before.

The dressing, after the removal of staphyloma, is simple and similar to that used after the operation for cataract. After a few weeks, when the cure is complete, an artificial eye may be introduced.

For further reading on Staphyloma the student is referred to Walton and Lawrencee.

#### OF ARTIFICIAL EYES.

As the loss of an eye is always attended with much deformity, often presenting a most unsightly appearance, we have reason to be thankful that the ingenuity of man has succeeded so well in providing a remedy—*the false or artificial eye*.

Artificial eyes are made of soft enamel and glass, and are tinted so as to correspond exactly with the color of the sound eye. The eye is inserted in the following manner: it must be made wet, and the broad or outer end first passed under the upper lid, slid as far as it will readily go, and kept there with the fore-finger of the one hand, while with that of the other, the under lid is drawn down till the lower part slips in. For removal, the lower lid must be depressed. A person soon learns to do this for himself.

## STRABISMUS, OR SQUINTING.

I notice this disease, with no intention to enter into its particulars, but with a view to have an opportunity of mentioning here a paper published in the London Lancet, in November, 1853, which deserves to be known to every physician. But before doing so, I will introduce one or two modes in which the surgical operation is performed.

Strabismus consists in a loss of parallelism between the two axes of vision. There are four varieties of the disorder: the internal or converging, the external or diverging, the superior or ascending, and the inferior or descending.

The most frequent cause which produces the disease is a contraction of the muscle corresponding to the direction of the squint. When the sound eye is covered, in the great majority of cases of strabismus, the affected eye immediately resumes its normal direction and motions; this affords evidence that the squint is not dependent upon tumor of the orbit or globe, or upon paralysis of the third or sixth pair of nerves or adhesions between the globe and eye-lids, etc.

OPERATIONS.—Stromeyer, in the year 1829, recommended the following operation: “The sound eye being closed, the patient is directed to carry the affected eye as far as possible in the direction opposite to that which it usually retains. If the strabismus is inward, a fine double hook should be inserted into the inner margin of the ocular conjunctiva, and confided to an intelligent assistant, who draws the eye outward; the conjunctiva, being raised up with the forceps, should be divided with a cataract

knife, the incision being directed towards the inner angle of the eye; the traction outward is then increased until the internal rectus muscle appears; a fine probe is then passed beneath the latter, and it is divided with the curved scissors, or with the knife with which the conjunctiva was opened.

Dieffenbach's Method: The instrumental apparatus is very simple—Pellier's elevator, a blunt double hook for drawing down the lower lid, two small sharp-pointed hooks for the conjunctiva, a pair of scissors curved on their flat surfaces for cutting the conjunctiva, a simple blunt hook to be passed beneath the muscle while it is being cut with the scissors which were used to incise the conjunctiva, a small sharp hook for the sclerotica in case the eye should turn spasmodically in such a manner as to interfere with the operation, a sponge, and a little cold water.

Two assistants are necessary even when the operation is performed on a quiet patient; more are required when the contrary is the case. The patient should be seated in a low chair, as in the operation for ectaraet, opposite to a window furnishing a good light, and the surgeon seated in front of him upon a chair somewhat higher. One of the assistants stands behind the patient, and supports his head steadily against his chest. Pellier's elevator is then introduced beneath the upper lid, and committed in charge to this assistant, and a second assistant depresses the lower eye-lid with the proper instrument, and at the same time keeps charge of the patient's hands; the sound eye is covered. (The case is supposed to be one of converging strabismus in the right eye.) The surgeon now inserts one of the small sharp hooks into

the conjunctiva near the caruncula lachrymalis, and draws the eye outward; if it resists, a second hook is inserted a line or two from the main edge of the cornea, the first being committed to an assistant. A fold of the mucous membrane being thus lifted up between the two hooks, the surgeon divides it freely with the curved scissors until the muscle is brought in sight; he then lays aside the scissors, takes the blunt hook and passes it beneath the muscle, between it and the sclerotica, withdraws the sharp hook so as to free his left hand, which then takes charge of the blunt one, and finally divides the muscle entirely across with the curved scissors first employed. When the muscle is properly divided, the eye generally resumes immediately its natural position. For the left eye, the operator carries his left arm across the patient's forehead, and manages with his left hand the sharp hook first inserted into the conjunctiva, whilst the assistant who stands behind the patient holds the elevator in his left hand and the other sharp hook in his right.

In cases of slight strabismus, Dieffenbach has proposed to excise with curved scissors a small flap, including both the conjunctiva and the contracted muscle. Cullier advises the addition of sutures to excision, and employs the ordinary probe-pointed eye scissors.

*The Cure of Squinting by the use of Prismatic Spectacles.*—Dr. Kurke, a Dutch physician, first recommended prismatic spectacles for the cure of squinting. He has recorded one case cured by their use, in the Dutch journals. Dr. von Graefc, of Berlin, has since employed them very extensively. Dr. T. Spencer Wills says: “During a recent visit to Berlin I had frequent opportunities of observing their effects upon patients, and I

think that the result of Dr. von Graefe's experience should be made known to the profession. The glasses are fitted in ordinary spectacle frames. They are simple prisms of various degrees, from one to twenty. It would be possible to make them achromatic, but I have only seen the ordinary ones in use."

The operation upon the sound eye, as explained by Dr. von Graefe, is as follows: When a prismatic glass is held before one eye, on any point of sight in the converging direction of the optic axes, the light falling upon this eye is diverted from its former course, and no longer arrives upon the *macula lutea* but forms a more or less eccentric picture, according to the refracting power of the prism. From its position, this is no longer combined with the central picture on the retina into one perception, but is perceived separately. Thus the object upon which the optic axes converge is seen double. Theoretically, this phenomenon should be observed when a prism of very moderate power is used; but observation teaches us, on the contrary, that no diplopia follows when weak prisms are employed, especially if the base be directed outward. This might be explained in two ways: either the picture on one retina is suppressed; or the eye which sees through the prism takes a new position which is not perceived by the observer, so that the picture is not formed eccentrically, but falls, like that of the other eye, on the *macula lutea*. The improbability of the first supposition at once appears from the fact that no diplopia is produced by a weak prism, while more powerful ones produce it at once, and the greater the eccentric position of the picture, the more easily it would be suppressed. The truth of the second explanation is established by a more exact obser-

vation of the position of the eyes. On applying the prism, we see the optic axes deviate from their former position and return to it as the prism is removed. At the moment of removal the object is seen double, because both axes are not directed upon it. Thus in order to prevent diplopia, an involuntary strabismus occurs, and we can produce this in any direction, by corresponding positions of the prism, but most decidedly so inward, less so outward, much less so downward, and least of all upward. We can also produce strabismus in this manner in diagonal directions.

It follows that by the use of prismatic glasses we have the power of altering the tension of any given muscle of one eye, without producing any alteration in the other. This is the peculiar advantage which none of the ordinary orthopœdic means formerly employed possessed; on the contrary, the result hoped for from their employment was not only frequently frustrated by the movement of association of the two eyes, but sometimes, as in cases of recent muscular paralysis, an effect directly the reverse of that desired was brought about. The increased contraction called for from the relaxed muscle by the use of prismatic glasses, is the source of their curative power. For example, in a case of convergent strabismus, with diplopia, a prism with its base directed outward, alters the position of the eccentric picture on the retina of the squinting eye so greatly, and brings it so near the macula lutea, that single vision follows any voluntary power conveyed to the abductor muscle. Consequently the angle of the squint is somewhat diminished. As it becomes less and the power of the abductor increases, prisms must be used gradually diminishing in power, until at last a

perfectly accurate corresponding position of the eye is attained at all distances; in other words, the squint is perfectly cured. I have seen patients of Dr. von Græfe who were thus completely cured in about six weeks, commencing with strong glasses, of the numbers from fifteen to twenty, and gradually wearing them less and less powerful. They are principally applicable in young persons, who squint but slightly, and in cases of diplopia binocularis, where the abnormal position of one eye is only observed when an object some feet distant is regarded, they are the only certain means of cure.

In more marked degrees of strabismus the muscle must be divided, because the use of strong prisms and the effort of the patient to avoid diplopia, become very troublesome; and if the union of the two images causes too great an effort, an effect is produced directly the reverse of that desired; for, if diplopia cannot be removed, the double images separate still farther from each other, because when distant they are not so intolerable as when near. In many cases, after operation for the cure of strabismus, by division of the muscle in one or both eyes, although great improvement follows, the cure is not perfect. Some degree of squint still exists in one eye, and probably some diplopia, when objects at a certain distance from the eye are attentively regarded. In such cases, the prismatic glasses suffice to complete the cure commenced by the operation.



## R E P E R T O R I U M .

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### I N T E R N A L R E M E D I E S .

#### *Emeticum Tartratis Antimonii :*

Rx Tartratis antimonii et potassæ, grana quatuor.

SIGNA.—Dissolve in a tea-cupful of hot water and give a tea-spoonful every ten minutes, till free vomiting is produced.

#### *Pulveres Disulphatis Quince :*

Rx Disulphatis quinæ, amyli, utriusque, grana sex,  
Ad viginti quatuor.

Misce, terendo in mortario, et dividi in pulveres duodecim.

SIGNA.—One to be given thrice daily.

#### *Solutio Iodidi Potassii :*

Rx Iodidi potassii, semi drachmam.  
Ad drachmas duas.  
Aquæ uncias duas, solye.

SIGNA.—A tea-spoonful to be taken in a wine-glassful of water thrice daily.

#### *Emulsio Terebinthinae :*

Rx Olei terebinthinae purificati, unciam.  
Bicarbonatis sodae, grana quindecim.  
Mucilaginis gummi acaciae Arabicae, uncias duas.

Misce, diligentur terendo in mortario, et adde gradatim.

Aquæ cinnamomi, uncias tres.  
Aquæ unciam, syrupi simplicis.  
Spiritus lavendulae compositi, utriusque semiunciam.

SIGNA.—Shake the phial, and take a table-spoonful thrice a day.

Rx Pulv. folior pulsatilla, nigricans drachma i.

F. c. suffic., q.

Extracti pulsatill. nigricantis lege artis pilulae, No. lx.

SIGNA.—From one to seven thrice a day. These pills and the following mixture are very highly recommended in the beginning of amaurosis.

Rx Herbae pulsatill. nigric., drachm. i—dr. iij, digere in vase clauso c. s. q.

Vini Gallici per horam unam ad colat. unc. viij, adde.

Syrupi cinamomi, unc. i.

Naphthae acetic, scrup. i.

SIGNA—To begin with a spoonful and increase the dose a little every day till about a small wine-glassful.

Rx Gum sagapen yalban. sapvenet., a, 3 i.

Rhei optim., 3 iss.

Tart. emet., gr. xvi.

Suc. liquerit, 3 i.

Plant pilulae gran quinque.

In amaurosis, these pills are to be given three at a time, every morning and evening, for a month or six weeks. Before giving them the stomach must be emptied by repeated emetics.

#### EXTERNAL REMEDIES.

Rx Camphorae croci oriental, una drach. sem.

Aloes hepatica. sarcocolla., ana drachm. i.

Bulliant in vase clauso cum vin.

Hispanic et aq. rosar, ana unc. iv.

As a wash for weak eyes.

Rx Extracti hyoscyami, drachm. i.

Solve in aquae distill., unc. i.

SIGNA.—Drop a few drops into the eye every four hours, in cases of iritis.

Rx Ammoniae carbonis., gr. x.

Extract. cicut.

Fell Taur. inspissat, ana drachm. i.

Aqua fontan, unc. ij.

SIGNA.—To drop into the eye a few drops twice a day, in opacity of the cornea.

Rx Alumin, drachm. ij.  
Plumbi acetas, ʒ i.  
Aqua distillat., unc. viij.

An excellent eye-water in chronic inflammation or blood-shot eyes.

Rx Alumin crud,  
Zincum sulphurica, ana unc. sem.  
Aqua distill. unc. xxxij.  
Coq usque ad solut filtra.

Eye-water in *epiphora*, (weeping eye.)

Rx Lapid. divin. c. ærugin parat., gr. ij.  
Aqua rosarum, drachm. vij.  
Mucilag. sem. cydonior., drachm. i.  
Tinct. opii crocat., drachm. sem.  
M. colat.

A very good wash in conjunctivitis and blennorrhœa, or gonorrhœal ophthalmia.

Rx Mercur. vivi depurat, unc. sem., ter. in mortar. vitro cum q. s.  
Mucilag. gum Arabic., ad perfect. exstinct mercur.  
sensim addendo,  
Lact. ebull, unc. iv.

SIGNA.—To serve for bathing the eyes several times a day, in syphilitic ophthalmia.

Rx Hydrarg. præcip. rubr. ben. trit., gr. viij-xvi.  
Æruginis bene trit., gr. iv-vi.  
Butyr recent insuls, unc. sem.  
M. f. exactiss. unguent.

A very good ointment.

Rx Mercur. præcip. rub., drachm. ij, et scm.  
Tutiae preparat., drachm. i.  
Camphoræ vitell. ovi. subact., drachm. sem.  
Butyr. recent. insuls, unc. iiij.  
Cerae albæ, unc. sem.  
M. f. unguent leni calore.

In opacity of the cornea, having melted about the bulk of a barley-eorn of the salve on the end of the finger, introduce it between the eye-lids. Then rub gently for about half a minute the upper eye-lid over the eye-ball, so that the salve is applied to the speck. Repeat this each night at bed-time.

Rx Hydrarg. muriat. corros., gr. i, solve in  
Aqua plantag., unc. x.

SIGNA.—To drop several times a day a few drops into the eye in case of inflammation of the eye after smallpox.

Rx Plumbum aceticum, gr. viij, solve in  
Aqua rosar., unc. ij.  
M. f. collyr.

To use with compresses to be placed on the eyes in cases of smallpox, to protect the eyes against inflammation.

Rx Lq. Ammon. caust., 5 ij.  
Olei menth. piperit., 3 ij.  
Ether. sulphuric, 3 i.

To use as a vapor before the eye, or to rub a few drops on the eye-brow, in cases of amaurosis.

Rx Folior rorismarinus, unc. ij.  
Spirit. vini callici mensur. dimid conquassan.  
Do saepius digerantur in lagena per triduum colat.

One part of the above spirits mixed with three parts water, and used as a bath for the eyes before retiring at night, in weak eyes from hard reading, writing, etc.

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